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AND  
COMMERCIAL REVIEW.

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OCTOBER, 1864.  
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THE NATIONAL DEBT AND NATIONAL RESOURCES.

THE payment of the National debt, which has now become so large, and which is growing with such rapidity, is a subject of absorbing interest to every one, and it is high time that the true principles of taxation, and the real resources of the nation, out of which it must be paid, should be clearly understood. During the first years of the war it was deemed patriotism to shut one's eyes to the expense of it, and so hold out the idea that the national resources were inexhaustible. Hence any one bold enough to raise his voice against the financial policy pursued was considered disloyal, and debt, quadrupled by reason of paper money, was pushed to the utmost limit. Now, however, the country is beginning to see that patriotism consists, rather in battling this wasteful system, than in abetting such measures as must exhaust the national resources before the object of the war can be obtained. Yet the idea is still diligently inculcated by many, and believed by some, that the national means are exhaustless, and that the success of the war cannot be endangered by any measure of extravagance and waste. Believing this error to be a dangerous, yes a fatal one—that it would soon bring us to bankruptcy and repudiation—we have done what we could, from time to time, to expose it, and show the necessity of a speedy return to a sound basis. Yet the Government paper issues are continued, and our debt is being multiplied by reason of them in a fearful ratio, and this is permitted by the country just because writers are found to flatter the people with the idea of our inexhaustible resources.

This idea, too, is encouraged by the further one that a few weeks will bring us peace and union again. Would to God that it might be so! but to manage our finances on the supposition that it will be, is, in the light of the past three and a-half years, wild in the extreme. Yet these twin errors—that the wealth of the country is inexhaustible, and that peace will very soon be declared—are deceptions that are helping one another, and if persisted in, and allowed to continue to give shape to our financial policy, can bring nothing but disaster.

Let us, then, for a few moments, look at this question of payment of our national debt, and see out of what it must be paid, if at all. And in doing this we may repeat some things said in our article of last month, in reply to the correspondent of the *Times*: but the subject is one of so much importance—involving really our national honor—and such incorrect notions are being disseminated by those who should know better, that we deem it a sacred duty to the country to expose the fallacies of the day.

The first great governing truth, then, we should remember, is that the national debt must be paid out of the national income; and the second is that our national income consists in the amount produced by the individuals composing the nation, less the amount consumed by them. Hence, therefore, the ability to pay can be increased only by increasing the amount produced, or decreasing the amount consumed. These propositions appear so plain and self-evident that one would think none could be found to doubt them. Yet superficial thinkers, instead of enquiring into the yearly income of the nation, to see what we as a people can pay, appeal to vague estimates of the prospective value of mines and other property, and start new theories, with the expectation of obtaining two golden eggs where there was but one before. One writer will thus point to our mineral resources, and say, with apparent sincerity, is there not within the very earth itself, many times the gold to pay our debt with! Surely there is; and the simple-minded man might also have added that the earth contained a greater source of wealth than even its gold—the richness enabling it to afford nourishment necessary for innumerable bushels of wheat and corn and oats. But can we sell those crops before we have raised them, or can we pay out the gold before it is mined? Furthermore, have we not been producing both gold and crops, heretofore, as fast as we could, with the capital and labor we possessed? Remember, too, that this same gold and richness was there when the Continental dollar was valueless; and for the same reason, the fact of their being such wealth in the earth now, will never add a cent towards the security of our debt, if the annual payments of interest, &c., more than equal the amount of our national savings from these and other sources. The mines are only of value to the nation for the amount of wealth they annually produce, over and above the expense of production.

Other writers take the money value of all the property in the country as evidence of ability to pay, and the unthinking public are caught by such a display. Thus we are informed that although the debt is \$2,000,000,000, and may possibly be \$4,000,000,000 before the war is terminated, yet the wealth of the country is \$16,159,000,000—meaning the census value attached in 1860 to all the land, slaves, utensils, buildings, ships, machinery, waterfalls, factories, railroads, public debt, incorporate capital, &c., in the whole country. A Mr. WELLS has recently published a pamphlet called "Our Burden and our Strength," in which he assumes that this nominal wealth is a means of paying the debt. Yet there never was a conclusion more unsound. For instance, a little reflection will show any person that 4,000,000 black slaves, whose money value is, by the census, \$2,160,000,000 of the above aggregate, can in no manner be applied to the payment of the public debt, except by the wealth they may annually produce after paying out of it the cost of their support,

the expense of the plantation, &c. In some years there is no surplus, and the planter's capital is diminished; while in others there is much. But for Mr. WELLS, or anyone else, to parade the nominal money value of these blacks (one-eighth of the whole aggregate value) as a resource for the payment of the debt now being contracted, is too much, we should fancy, for the credulity of anyone.\*

And if this is the case with the blacks, is it in any way different with regard to the value of the lands they cultivate, which lands are also estimated at \$4,000,000,000, in this grand aggregate from the census of \$16,159,000,000? Clearly not. The only value of those lands consists in the annual production which the black labor draws from them. That value, in 1860, was, per census: Naval stores, \$3,695,474; rice, \$2,207,148; tobacco, \$21,074,038; sugar, 31,455,241; cotton, \$204,128,493: making a total production of \$262,560,394, by 4,000,000 slaves, or \$65 64 per head. But it costs \$75 per annum to support the hand, and this, therefore, gives a loss of \$10, which is made up by other productions, such as food, &c. In some years there is, no doubt, a surplus. But this is first applicable (unless the plantation is to decrease in value each year) to the improvement of land, the construction of fences and houses and roads, and to the increase of machines, implements, furniture, &c.; and then the remaining balance is the fund out of which the payment of town, county, state and federal taxes must be made. At the North the value of land has also acquired great proportions (and is so put down in the census estimate), because the labor of settlers, by the aid of machinery, has drawn from it a very large annual supply of produce; and out of the surplus, after the support of the family, the repairs of fences and buildings, their extension, &c., have been defrayed. The nominal value of the land, from which the produce has been drawn, is no more applicable to the payment of the present debt, than it was to the expenses of the revolutionary war.

In this country almost within the memory of some of its inhabitants, the land (now thickly settled) has been a wilderness, but has gradually been reclaimed from the domination of the savages by the patient industry of poor emigrants. Most of these have gone on to land, which they cleared and planted, suffering every privation until the first crops were grown, and Indian corn has been the main dependence of them all. It grew early and easily, and at once gave food to man and beast. The

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\* This same Mr. WELLS, for the purpose of showing how *little* a burden the debt is, calls the amount of it \$1,750,000,000, and then says, it is *only* equivalent to \$72 92 for each person. In other words, every family in the land (counting five to each family) owed, through the general government, \$364 60 when the debt was only \$1,750,000,000, and, on the first of January, will owe about \$600. This at six per cent would make \$36 interest for each family to pay each year; and if we add to this the probable peace expenses of the government (which we have shown would be as much more), it would make \$72 as the annual payment of each family to the United States Government if the war was closed the first of January! Now, let Mr. WELLS do one more sum—let him tell us how many families there are in the country able to pay \$72 a year taxes—and if he does it correctly, he will find that he has made the most discouraging and startling estimate of "our burden and our strength" any of us have seen.



patient settler was also enabled to save something of the first years crop and purchase comforts. Gradually the log hut was changed for a "shingle palace." Trees grew, cattle multiplied, and furniture was bought. In this manner his industry of many years at length gave an air of wealth about him, because the land being productive, and there being no rent or taxes to pay, all his surplus went on to his farm in the way of improvements. Thus the farm, which was worth nothing when he went upon it, is now estimated at a value of \$10,000. The real value in a national point of view, however, consists only in the surplus the farmer sells. The most of his year's labor is to provide food for his family and animals, but whatever surplus there is, if any, he will sell, and with the proceeds improve his farm and purchase tea, coffee, clothing, and other supplies, and pay his medical bills, local taxes, etc. The remainder, and only the remainder, is a part of the national savings out of which the debt can be paid.

In like manner the railroads that cost \$1,000,000,000, the ships that cost \$300,000,000, the buildings that cost an immense sum, the factories full of machinery, are applicable to the payment of taxes only in so far as their surplus profits go. That surplus has a well defined limit.

As one more instance, take the Illinois Central Railroad. That road is the result of three years labor of ten thousand men, representing probably seven thousand families of five persons each. These families consumed, while the work was in progress, three million bushels of grain, and potatoes worth \$4,000,000, and \$500,000 worth of manufactures; and the iron was bought with grain shipped to the extent of \$4,000,000 more. Thus that road is the accumulation of a large amount of land products and labor, and in the census aggregate is put down at its full cost. Evidently, however, it is not available for any purpose of taxation beyond what its revenue will give above the expense of working.

Thus we might go on indefinitely illustrating that it is only to this surplus revenue, to the national income, we can look for the means to pay our debt. It is worse than folly at such a time as this to parade the census value of all this property, or to point to our mines and declaim upon our boundless wealth. We have been and are a greatly favored nation, and unless production becomes so fettered by debt and taxation, as to prevent our national growth, a future of great prosperity awaits us. But from what we have already said it is evident there is a limit to our ability to pay taxes. A child can see that if the poor emigrant, when he first went on to his land, had been called upon to give any portion of his first years crop to the general government directly, or if he had been compelled to give it indirectly, by reason of a tax on manufactures, which would require him to pay an additional sum for his winter clothing, he would have had less left to improve his new home with. And if those taxes, direct or indirect, should become so heavy as to make it impossible for him to pay them and spend anything on his land, his enterprise would of necessity be soon given up. It becomes then a question of the first importance how much interest can we meet without crippling production.

To measure accurately the net income of the nation is of course impossible, and yet through the census we can approximate sufficiently near for the purposes of this inquiry. In our last number we gave the savings of the Northern States up to 1860 at \$2,632,709,497, from this we concluded that the annual savings for the ten years, from 1850 to 1860, could



not have been more than \$60,000,000 a year. Such then is probably the amount of the actual savings of the Northern States in 1860. Of course, however, it does not follow that we can pay but \$60,000,000 additional taxes, or that if the federal taxes in these Northern States had amounted to \$60,000,000 more than they were in 1860, there would have been no accumulation that year, since the necessity of paying such taxes would have and will induce greater economy. Economy, however, means decreased consumption, and must therefore react injuriously on production. Of course if every man in saving money to pay his taxes buys one coat less, there is so much less produced and also so much less profit to the manufacturer and merchant. Economy, therefore, causes not only decreased consumption but decreased production and decreased national profits. But to what extent that economy can be carried without destroying the productive interests of the country is the important question.

We have from the census report prepared with great care the following table of the probable profits of the whole country from all sources during 1860:

NATIONAL PROFITS DURING 1860.

From agricultural productions.....	\$100,000,000
From industrial products.....	125,000,000
For stocks except manufacturing which are included above.....	55,000,000
For mines, fisheries, and carrying trade.....	50,000,000
<b>Total profits North and South.....</b>	<b>\$330,000,000</b>

This is the fund out of which the farmer buys his clothing and agricultural implements, repairs and enlarges his buildings, and pays his taxes.

And in 1860, as we have stated above, all of this sum that was earned in the Northern States was thus and otherwise expended, except \$60,000,000 which was laid up. To this fund, then, and this alone we must look to pay our debt. The strictest economy could not increase our tax paying ability beyond the amount of these profits. Besides, out of them must first be allowed sufficient for the emigrant to buy the necessary farming implements and improve his farm, or, as we stated before, he will soon give up his enterprise; and all classes will require sufficient of their income left them to provide for their family wants, or their labor will be in vain. The balance, after paying these necessary expenses, measures the extent to which economy may be carried. Is then this fund sufficient to allow us to throw away anything more by further uses of paper money? And do not these figures furnish a sad commentary on the acts of those, who have heedlessly increased our debt, yes wasted our resources, and are still doing so, by their paper issues?

The expenses of Government after peace is restored were estimated by Mr. Chase in his last annual report, page 12, at \$178,838,010, as follows:

Interest.....	\$85,587,676
Civil service.....	37,604,499
Army and navy.....	55,845,834
<b>Total.....</b>	<b>\$178,838,010</b>

These estimates are however clearly unreliable. The debt is now \$2,000,000,000, and will be at least \$2,500,000,000 by the first of Janu-

ary. If, therefore, we have peace at that time the annual expenses of Government would be about as follows if our finances were ably managed :

Interest on the debt at six per cent.....	\$150,000,000
The pension list will now reach at least.....	50,000,000
Army and navy.....	75,000,000
Civil service.....	35,000,000
Total.....	\$310,000,000

These estimates of the expenses of the Government after the war are, we believe, less than can be expected without the strictest economy. Then, besides this, we have largely increased city, county, town, and State taxes. An idea of the extent of this latter burden may be gathered from the expense of raising this last call of five hundred thousand men; cities and counties having paid a bounty of from \$500 to \$1,000 for each man. If we estimate the average bounty paid at only \$600, we have an aggregate debt of \$300,000,000 incurred for this one purpose.

Thus we see that if the war is closed by the first of January, there will be from three to four hundred million dollars of taxes to be paid without mentioning the amount required for the sinking fund. Previous to the war we paid in taxes about \$70,000,000, leaving at least \$300,000,000 additional to be raised hereafter out of our national income simply to pay our current expenses and interest.

To add to the force of these figures would be impossible. They speak more earnestly than anything we could say of the wretchedness of our past policy and the importance of the future. Clearly our resources are not inexhaustible, and he who preaches such a doctrine is, we had almost said, the worst enemy the country can have; for he encourages a system that can but lead to national dishonor.

## THE COMMERCIAL PROGRESS AND RESOURCES OF CENTRAL BRITISH AMERICA.

### THE LAKE WINNIPEG AND SASKATCHEWAN DISTRICTS.

By HENRY YOULE HIND, M.A., F.R.G.S., Trinity College, Toronto. (Read before the Statistical Society of London, 19th January, 1864.)

[CONTINUED FROM PAGE 192.]

### VI.—*Communication with Central British America.*

The questions which relate to the facilities for communication between the Lake Winnipeg basin and this country, through British or American territory, and the extension of that communication across the Continent to the Pacific, may now be discussed.

It has already been stated that, with the single exception of 200 miles of road traversed by well appointed stage coaches, the communication

from Liverpool to Fort Garry, or indeed the grand falls of the Saskatchewan, can be made by steam.

The successive steps in this route are as follows :

	Days.
1. Liverpool to Quebec, steamer.....	10
2. Quebec to La Crosse, railway.....	3
3. La Crosse to St. Paul, steamer.....	1½
4. St. Paul to Fort Abercrombie, stages.....	3½
5. Fort Abercrombie to Fort Garry, steamer.....	4
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The following route is also practicable :

1. Liverpool to Superior City by steamer.
2. Superior City to Fort Abercrombie, road.
3. Fort Abercrombie to Fort Garry, steamer.

The present difficulty of this route is the nature of the road between Superior City and Crow Wing, which, being cut through a wooded country, is still, in the language of the country, rather "rough" as yet.

The next link in a route across the Continent is from Fort Garry to the New Westminster, in British Columbia. And in order to illustrate the singular and wholly unexpected topographical facilities which exist in the basin of Lake Winnipeg, the Rocky Mountains, and British Columbia for commercial intercourse, I shall venture to describe, in as brief a manner as possible, the journey of the Canadian emigrants of 1862 through that vast extent of country. My brother, Mr. WILLIAM HIND, who accompanied me on an exploration into the interior of the Labrador Peninsula in 1861, went with this party for the express purpose of sketching the passes through the Rocky Mountains and all natural features on the line of route.

#### VII.—*The Canadian Emigrant Route across the Continent.*

The Canadian emigrant party assembled at Fort Garry in June, 1862, travelling thither by Detroit, La Crosse, St. Paul, and Fort Abercrombie, by rail, stage and steamer. At Fort Garry they separated into two parties; the first division contained about one hundred emigrants, the second division, sixty-five persons in all. The first party took the northern route, by Carlton to Edmonton, the second, the southern trail. At Edmonton they all changed their carts for horses and oxen, and went thence in a straight line to the Leather Pass (lat. 54°), through which they took 130 oxen and about 70 horses. They suddenly found themselves on the head waters of the Frazer river, and so gentle was the ascent that the only means they had of knowing they had passed the divided ridge of the Rocky Mountains was by unexpectedly observing the waters of the rivers flowing to the westward. When in the mountains, they killed a few oxen for provisions; others were sold to the Indians at Tête Jaune Cache, on the Frazer, and others were *rafted* down the Frazer to the forks of the Quesnelle.

At Tête Jaune Cache a portion of the party separated from the rest, and, with fourteen horses, went across the country, by an old well-worn trail, to Thompson's River, and thus succeeded in taking their horses from Fort Garry, through the Rocky Mountains, through a supposed impassable



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part of British Columbia, to the wintering station on Thompson's River for the pack animals of the British Columbia gold seekers. With this party of more than 150 people were a woman and three little children. The little children were well cared for, for the emigrants took a cow with them, and these infant travellers were supplied with milk all the way on their long journey to the Leather Pass in the Rocky Mountains. I look upon the successful journey of the Canadian emigrants of 1862, across the Continent, as an event in the history of Central British America of unexampled importance. It cannot fail to open the eyes of all thinking men to the singular natural features of the country which formed the scene of this remarkable journey. Probably there is no other continuous stretch of country in the world, exceeding 1,600 miles in length, and wholly in a state of nature, which it would be possible for 150 people, including a woman and three children, to traverse during a single short season, and successfully, and, indeed, easily overcome such apparently formidable obstacles as the Rocky Mountains have been supposed to present.

The Leather or Miette Pass lies in latitude 54°, and has long been known to the employes of the Hudson's Bay Company, and is called by them the "Old Columbia Trail" or "Jasper Pass." It will be observed that it forms an immediate and direct connection with the great artery of British Columbia, namely, the Frazer river. The other passes to the south connect with the Columbia river, which flows for many hundred miles through Washington territory. It will not fail to be noticed, too, that the existence of this route, *via* the Leather Pass, has only very recently appeared on published maps. It is shown on ARROWSMITH's map of British Columbia, published in 1860, but the success with which its long established connection with the Frazer was concealed by the late Hudson's Bay Company is a singular instance of the unity of purpose which has pervaded all the actions of that powerful corporation, during their long tenure of absolute control over a portion of British America, containing more land suitable for the abode of man than the province of Canada itself, and which has already cost in its defence from aggression many millions of money and many thousands of lives. It seems remarkable that the Leather Pass, and its easy connection with the Frazer river, escaped the attention of the exploring party sent by the British Government, under Captain PALLISER, in 1857, 1858 and 1859. If the existence of this unobstructed communication between the Athabaska valley and British Columbia had been made known to the world as one of the results of that expedition, probably long ere this the British Government would have taken measures to establish a separate Government in Central British America, and open a communication across the Continent through British territory. Dr. HECTOR actually passed the "Old Columbia Trail," but neither his guides nor the people at St. Ann's or Edmonton appear to have informed him of its existence. Fortunately the Leather Pass has now been traversed by men, a woman, children, and numerous oxen and horses. The Frazer river has been safely descended for 400 miles from its source, in canoes and on rafts, by a very numerous party, and it has been *ascended* in a boat from Cariboo to the Tête Jaune Cache; and from this last-named place there is a well known trail for horses to the Thompson's river, and thence to New Westminster, which has also been traversed by Canadian emigrants with horses; and more recently, according to



Victoria papers, by Lord MILTON, with thirteen horses. The difficulties of the Rocky Mountains have, in great part, melted away, and the "impossibilities" of the overland route have vanished, just as the "uninhabitable deserts and swamps" of the Saskatchewan have given place to boundless fertile prairies, which will probably become—even in our generation—the seat of an enterprising and prosperous people.

#### VIII.—*Comparison between British and United States Routes across the Continent.*

Not only is the track of the Canadian emigrants suggestive as to the nature of the country they traversed so easily, but in comparison with the explored routes for a Pacific railway within the limits of the United States it assumes a new importance. The present President of the Southern States, when Mr. Secretary DAVIS, summed up the comparisons of the different routes in the United States, as regards the character of the country they traverse. The following is an abbreviation of the summary :

	Miles.
Route near the 47th and 49th parallels, from St. Paul to } Vancouver .....	1,864
Number of miles through arable land.....	374
Number of miles through land generally uncultivable, arable } soil being found in small areas .....	1,490

The greatest number of miles of route through arable land on any one of the lines surveyed is 670 miles, in a distance of 2,290 miles. The least number of miles of route through generally uncultivable soil is 1,210, on a line of 1,618 miles in length, near the 32nd parallel.

From the Lake of the Woods, or from Pembina, a line in British territory instead of passing through a desert incapable of supporting human life, would traverse a fertile belt of country, averaging 100 miles in breadth, fully able to sustain five times as many people as Canada now possesses, and leading directly towards the lowest and by far the most facile pass in the Rocky Mountains.

The arid region of the Missouri valley commences west of the 100th degree of longitude divides the United States into two nearly equal parts on the 40th parallel of latitude. The eastern half is the present fertile and peopled part of the country. The western half is a comparative desert all the way to the Pacific.\* It is in comparison with this immense

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\* The cause of the aridity and unfitness for settlement of fully one-third of the United States has been ably discussed by distinguished meteorologists. This remarkable feature, extending over a portion of the American continent within the limits of the United States of more than 1,000,000 square miles in area, is highly important in relation to the valley of the south branch of the Saskatchewan, to a large part of which the same peculiarity belongs. The physical geography of the arid region in the United States has been very admirably described by Dr. JOSEPH HENRY.\*

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\* "Meteorology in its Connection with Agriculture," by Professor JOSEPH HENRY, Secretary of the Smithsonian Institution.

desert that the fertile belt at the edge of the woods, stretching in the Saskatchewan valley from the Lake of the Woods to the Rocky Mountains, stands out in such surprising contrast. The cause of this exceptional character is, in great part, due to the drift deposits which cover the fertile belt. There is, therefore, a geological as well as a climatological reason. Sixty thousand square miles of arable land in Central British America mark out the true pathway across the Continent, which alone is capable of sustaining an efficient means of communication, whether in the form of a stage road or ultimately of a railway, by the growth of a local population. But the favorable comparison does not rest here. The mountain region, which offers such a difficult barrier to communication between the Pacific and the valley of the Mississippi, possesses peculiarities in British America which are in themselves of a very striking character, and quite sufficient to establish the line of route, cutting diagonally the 50th, 51st, 52nd and 53rd parallels, as far superior in point of physical conformation

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"The general character of the soil between the Mississippi river and the Atlantic is that of great fertility, and as a whole, in its natural condition, with some exceptions at the west, is well supplied with timber. The portion also on the western side of the Mississippi, as far as the 98th meridian, including the States of Texas, Louisiana, Arkansas, Missouri, Iowa, and Minnesota, and portions of the territory of Kansas and Nebraska, are fertile, though abounding in prairies and subject occasionally to droughts. But the whole space to the west, between the 98th meridian and the Rocky Mountains, denominated the Great American plains, is a barren waste over which the eye may roam to the extent of the visible horizon with scarcely an object to break the monotony.

"From the Rocky Mountains to the Pacific, with the exception of the rich but narrow belt along the ocean, the country may also be considered, in comparison with other portions of the United States, a wilderness unfitted for the uses of the husbandman; although in some of the mountain valleys, as at Salt Lake, by means of irrigation, a precarious supply of food may be obtained sufficient to sustain a considerable population, provided they can be induced to submit to privations from which American citizens generally would shrink. The portions of the mountain system further south are equally inhospitable, though they have been represented to be of a different character. In traversing this region, whole days are frequently passed without meeting a rivulet or spring of water to slake the thirst of the weary traveler.

"We have stated that the entire region west of the 98th degree of west longitude, with the exception of a small portion of Western Texas and the narrow border along the Pacific, is a country of comparatively little value to the agriculturist; and, perhaps, it will astonish the reader if we direct his attention to the fact that this line, which passes southward from Lake Winnipeg to the Gulf of Mexico, will divide the whole surface of the United States into two nearly equal parts. This statement, when fully appreciated, will serve to dissipate some of the dreams which have been considered as realities as to the destiny of the western part of the North American continent. Truth, however, transcends even the laudable feelings of pride of country; and in order properly to direct the policy of this great confederacy, it is necessary to be well acquainted with the theatre on which its future history is to be enacted, and by whose character it will mainly be shaped."

to any other lines of route which have been explored in British America or the United States.\*

The candid opinion of Professor JOSEPH HENRY regarding the adaptation of a large portion of the United States for settlement is confirmed and strengthened by the following excellent summary, from the pen of Major EMORY of the United States and Mexican Boundary Commission. It will at once occur to the reader that a knowledge of these facts gives great additional value to the truly fertile valleys of Red River, the Assiniboine, part of the Qu'appelle, and portions of the south and north branches of the Saskatchewan. It determines also the direction in which efforts should be made to people this great wilderness, and guide the progress of settlement in such a manner as will render the country available for that grand desideratum, a route across the Continent:

"In the fanciful and exaggerated description given by many of the character of the western half of the Continent, some have no doubt been influenced by a desire to favor particular routes of travel for the emigrants to follow; others by a desire to commend themselves to the political favor of those interested in the settlement and sale of the lands; but much the greater portion by estimating the soil alone, which is generally good, without giving due weight to the infrequency of rains, or the absence of the necessary humidity in the atmosphere, to produce a profitable vegetation. But be the motive what it may, the influence has been equally unfortunate by directing legislation and the military occupation of the country, as if it were susceptible of continuous settlement from the peaks of the Alleghannies to the shores of the Pacific.

"Hypothetical geography has proceeded far enough in the United States. In no country has it been carried to such an extent, or been attended with more disastrous

\* Table of comparison between the different passes in the Rocky Mountains, in the United States and in British territory, north of latitude 38°:

<i>United States—</i>	Altitude of Pass. Feet.
Surveyed route between the 38th and 39th parallels of latitude..	10,032
Route between the 41st and 42nd parallels.....	8,373
"              47th and 49th       "       .....	6,044
<i>British territory—</i>	
Kananaski Pass, from the South Saskatchewan to the Kootanie } river.....	5,985
Kicking Horse Pass, from South Saskatchewan to the Columbia..	5,420
Vermillion Pass, from the South Saskatchewan to the Kootanie } river.....	4,944
"Old Columbia Trail," or Leather Pass, from the Athabaska to } the Frazer—the Canadian emigrant route—probably below. }	4,500

The breadth of country forming a continuous mountain region is far greater in the United States than in British America. The United States is crossed by three great systems of mountains, extending generally from north to south. The first system, beginning with the Sierra Madre, and terminating in the Black Hills of Nebraska territory, is partially gorged by the Rio Grande, completely cut through by the North Platte and the Sweet Water Rivers, and turned by the Missouri. It does not extend into British America. The total breadth of mountainous country, in the proper acceptance of the term, within the limits of the United States, varies from 500 to 900 miles. In British Columbia, the distance is not more than 380 miles from the Leather Portage to the Pacific, and the distance, in an air line from the Leather Portage to the extremity of Belhoola inlet, the possible terminus, of a route, does not exceed 400 miles.



consequences. This pernicious system was commenced under the eminent auspices of Baron HUMBOLDT, who, from a few excursions into Mexico, attempted to figure the whole North American Continent. It has been followed by individuals to carry out objects of their own. In this way it has come to pass that, with no other evidence than that furnished by a party of persons travelling on mule back, at the top of their speed, across the Continent, the opinion of the country has been held in suspense upon the subject of the proper route for a railway, and even a preference created in the public mind in favor of a route which actual survey has demonstrated to be the most impracticable of all the routes between the 49th and 32nd parallels of latitude. On the same kind of unsubstantial information, maps of the whole Continent have been produced and engraved in the highest style of art, and sent forth to receive the patronage of Congress, and the applause of geographical societies at home and abroad, while the substantial contributors to accurate geography have seen their works pilfered and distorted, and themselves overlooked and forgotten. \* \* \*

"The plains or basins which I have described as occurring in the mountain system, are not the great plains of North America which are referred to so often in the newspaper literature of the day, in the expressions, 'News from the Plains,' 'Indian Depredations on the Plains,' &c.

"The term 'plains,' is applied to the extensive inclined surface reaching from the base of the Rocky Mountains to the shores of the Gulf of Mexico and the valley of the Mississippi, and form a feature in the geography of the western country as notable as any other. Except on the borders of the streams which traverse the plains in their course to the valley of the Mississippi, scarcely anything exists deserving the name of vegetation. The soil is composed of disintegrated rocks, covered by a loam an inch or two in thickness, which is composed of the exuvie of animals and decayed vegetable matter.

"The growth on them is principally a short but nutritious grass, called buffalo grass (*Sylvestria Dyctaloides*). A narrow strip of alluvial soil, supporting a coarse grass and a few cotton-wood trees, marks the line of the watercourses, which are themselves sufficiently few and far between.

"Whatever may be said to the contrary, these plains west of the 100th meridian are wholly unsuceptible of sustaining an agricultural population, until you reach sufficiently far south to encounter the rains from the tropics.

"The precise limits of these rains I am not prepared to give, but think the Red River (of Louisiana) is, perhaps, as far north as they extend. South of that river the plains are covered with grass of larger and more vigorous growth. That which is most widely spread over the face of the country is the grama or mezquite grass, of which there are many varieties. This is incomparably the most nutritious grass known."\*

#### IX.—Communication between Canada and Central British America.

In Canada we are separated from the fertile part of Central British America by six degrees of longitude, which must be traversed before we can reach the edge of the fertile belt. This barrier has frequently been upheld as an insuperable objection to a practicable commercial communication between Canada and Central British America, in the absence of correct knowledge of the physical features of the country. The utmost length of the barrier which requires the construction of a road scarcely exceeds 200 miles. From its western extremity there is an unobstructed navigation, with but one break, to the edge of the fertile prairies of Central British America *via* Rainy River and the Lake of the Woods; and its eastern extremity is connected uninterruptedly with the sea by the great lakes and the St. Lawrence. The highest point over which the road from

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\* "Report on the United States and Mexican Boundary Survey, made under the direction of the Secretary of the Interior," by WILLIAM H. EMORY, Major First Cavalry and United States' Commissioner. Washington, 1846, pp. 43-47.

Lake Superior to the northern indent of Rainy Lake must pass is not 900 feet above Lake Superior; and for the first 30 miles it would traverse a country susceptible of tillage for several miles on either side, and part of it already occupied by settlers. Then follows a sudden rise, marked by the great drift bank of Dog Lake, which forms the eastern limit of a drift-covered country stretching in a north-east and south-west direction, and having a breadth of about 90 miles where the road would cross it. This accumulation of drift covers the height of land to a depth certainly exceeding 150 feet, as shown by the hills at the summit level at Prairie Portage, 885 feet above Lake Superior, and the highest point on the line of road. There are no serious physical impediments to overcome between Lake Superior and the northern indent of Rainy Lake, either for a wagon road or a railway; and this short link of 200 miles completed, the distance between Fort William on Lake Superior and the commencement of the arable prairies of the valley of Red River would be reduced to 200 miles of road or railroad, and 180 miles of steam navigation. Here, then, we see no formidable impediments, which an impression derived from the custom of traversing the country in canoes through the rocky channels of rapid rivers or hill-embosomed lakes had created in the minds of the few who have traversed that region;—impressions which have been too readily accepted by the public at a time when no particular commercial interests were at stake, except those of the fur trade, and when a policy diametrically opposed to that now entertained by the existing Hudson's Bay Company was pursued with singular success by their predecessors.

*X.—Communication via Hudson's Bay.*

In contemplating the future of Central British America one important feature appears to be neglected, if not entirely overlooked. While Lake Winnipeg is 2,500 miles from the sea board of the Gulf of St. Lawrence, and lies exactly in the centre of the American Continent under the 51st parallel, its northern extremity is only 380 miles from the tide waters of Hudson's Bay.

The mouth of the Saskatchewan is as near to the open sea as Fort Garry is to the western extremity of Lake Superior. The passage from Norway House, at the northern extremity of Lake Winnipeg, to Hudson's Bay is made in nine days with loaded boats. It is not unreasonable to suppose that by the introduction of tramways over the portages the journey may be made in four days, thus bringing Lake Winnipeg within four days of the sea, yet the nature of the communication now followed is such that it would not admit of vessels much larger than freighters' boats being employed. The navigation of Hudson's Bay for sailing vessels is safe for a period not exceeding six weeks—for steamers it may be double that time. Hitherto the mode of communication adopted by the fur traders between Norway House and Hudson's Bay has been sufficient for the exigencies of the fur trade; it is not at all improbable that more easy means of communication with the sea board exists than those which are now pursued. Under any circumstances it is a fact of the highest importance that Lake Winnipeg is actually within a week's journey of the ocean, over a natural road by which troops have already entered and departed from Central British America. It is more than probable that whenever the necessity arises, the communication between Lake Winnipeg and Hudson's Bay,

and thence to the Atlantic, by the aid of steamers, will be made easy and speedy for at least three months in the year.

The outlet by which the waters of the Saskatchewan and Lake Winnipeg reach the sea is Nelson River. The chief reason which induces the Hudson's Bay Company to send their cargoes of furs to York Factory by Hayes River is stated to be the difficulties and dangers of the tracking ground on the banks of Nelson River, arising from impending masses of ice on the precipitous banks. The head of tide-water in Nelson River may yet become the seat of the Archangel of Central British America, and the great and ancient Russian northern port—at one time the sole outlet of that vast empire—find its parallel in Hudson's Bay.

*XI.—No other Area suitable for Extensive Settlement in British America besides the Lake Winnipeg and Saskatchewan Districts.*

Let it be observed that one great fact can be no longer overlooked, viz., that there is no other unoccupied part of North America, "whatever may be said to the contrary," other than the Lake Winnipeg and the Saskatchewan districts, where the establishment and growth of a new nation is possible. The same aridity which renders the United States a desert west of the 100th degree of longitude converts many of their great rivers, so prominently marked on the maps, into detached ponds during the summer season,\* while the Saskatchewan, which flows from west to east across the basin of Lake Winnipeg, is navigable far above Carlton during six weeks in the year for steamers of shallow draught; in spring and autumn it is not navigable further than Carlton. It is important to bear in mind that the Saskatchewan attains its maximum in July, and before and after that month its waters are considerably lower than during its "summer rise." This fact will account for the difficulties in navigating the Saskatchewan, which have been described by travellers as occurring in the spring or autumn, *before* the melting snows of the mountains reach Edmonton, or *after* they have passed it on their way to the sea.

*XII.—The Progress of Minnesota, Dekotah and Nebraska.*

The State of Minnesota and the territories of Dakotah and Nebraska border on the districts of Lake Winnipeg and the Saskatchewan. Minnesota was organized as a territory in 1849, admitted into the Union as a State in 1857, and, with an area of 83,531 square miles, it has now a population exceeding 200,000 souls.† The census valuation of the real and personal property in the State in 1860 was \$52,294,413. The State income for eleven months in 1861 was \$106,462, and the expenditure for the same period was \$110,732.

In 1863 the projected railroads in this frontier State extended over 1,167 miles, and the sum already expended on them at that date (1st January, 1863), was \$3,200,000.‡ The quantity of wheat produced in

\* See papers by Dr. JOSEPH HENRY, Secretary of Smithsonian Institution, and by Major EMORY, of the Mexican Boundary Survey, on this subject. These papers are published in the "Transactions of the Smithsonian Institute," and in the "Report of Mexican Boundary Survey." See also Reports of the Pacific Railway, and Lieutenant WARREN's exploration in Nebraska and Dakotah.

† 173,355 by the census of 1860.

‡ "American Railroad Journal."



1860 was 5,101,432 bushels, nearly 3,000,000 bushels of oats, and 3,143,577 bushels of Indian corn.

The contribution of Minnesota to the volunteer army has already reached the following large numbers:—

	Number of Men.
10 regiments of infantry.....	9,065
1 regiment and 3 companies of cavalry.....	1,485
2 batteries of artillery.....	212
2 companies of sharpshooters.....	195
Total .....	<u>10,957</u>

These men have all engaged for three years, or for the war. The total number of forces Minnesota has sent into the field since the commencement of the war amounts to 11,887 men. Such are the resources of the new State of Minnesota, bordering on the Lake Winnipeg district. Twelve years since it was for the most part an uninhabited wilderness; now it has sent an army of nearly 12,000 men into the field.

Dakotah territory, which lies west of Minnesota and whose northern boundary is conterminous with part of the districts in British America referred to in this paper, was organized in 1861. Its area is 325,000 square miles. Much of it lies within the limits of the American desert, and will never be peopled with white men. It contains a population of 44,501, of which 39,664 are Indians.

Nebraska territory lies west of Dakotah; in 1860 its population was 28,841, besides 5,072 Indians. The aridity of this territory will for ever prevent it from assuming any great commercial or political importance.

### XIII.—Indian Population in Central British America.

Great misapprehension exists as to the numbers of the Indian population of Rupert's Land. They do not exceed 40,000 in all. The number inhabiting the prairies and plains of the Lake Winnipeg and Saskatchewan districts do not exceed 20,000 at the present time. Under proper management the Indian would become the most useful and tractable protectors of a telegraph line. Once impressed with the idea that it is something supernatural, they would cherish it, protect it, and reverence it as a "manitou," or superior spirit, exercising a control over their fortunes and even lives.

### XIV.—General View of British America.

The total population of British America at the present moment approaches four millions, and the quantity of land *available for agricultural purposes* is approximately 267,000 square miles—or more than twice the area of the United Kingdom of Great Britain and Ireland; and equal to France (including Corsica), Belgium, Holland, and Portugal combined.

	Area in Square Miles.	Estimated Population, January, 1861.
New Brunswick.....	— 27,620	295,000
Nova Scotia and the Island of Cape Breton .....	— 18,600	352,000
Newfoundland .....	— 36,000	140,000
Prince Edward Island.....	— 2,133	95,000
Total area.. .....	— 84,353	882,000

Estimated area available for agricultural purposes .....	52,000	—	—
Upper Canada .....	—	140,000	1,520,000
Lower " .....	—	200,000	1,200,000
Estimated area available for agricultural settlement.....	90,000	—	—
Basin of Lake Winnipeg and Valley of the River Athabaska .....	—	400,000	15,000
[Exclusive of Indian population, 40,000.]			
Estimated area available for agricultural settlement.....	95,000	—	—
British Columbia and Vancouver's Island..	—	210,000	50,000
[Exclusive of Indian population, 60,000.]			
Assumed area suitable for agricultural purposes .....	30,000	—	—
Total area.....	—	1,084,353	3,667,800
Estimated area available for agricultural purposes .....	267,000	—	—

Or about nine times the area of Great Britain and Ireland. But throwing out what may be called the inferior and desert portion of this immense territory, we find the area of the agricultural portion to be approximately 267,000 square miles, or as large as France, Holland and Denmark put together, with an aggregate population approaching *four millions*.

Six years only have elapsed since public attention in England and America was first directed to the Lake Winnipeg and Saskatchewan districts. During that period not only has satisfactory evidence been obtained of the existence of mineral wealth, in the form of coal, iron ores, salt, and gold, but there are good scientific grounds for the belief that the original matrix of the auriferous drift will be found to extend far north of the Saskatchewan district, towards and perhaps beyond Lake Athabaska. The Hudson's Bay Company, in the recent report of the committee, state that "they are prepared to meet the wishes of Her Majesty's Government and the spirit of the times, by assisting in the settlement of any portion of the territory which may be fit for it, or by facilitating the transmission of intelligence by post or telegraph, and aiding general communication where it may be practicable to do so."

Who can forsee the importance, or estimate the value of telegraphic communication with our Pacific posts, now that the British Pacific fleet finds a suitable station in our own territory? Now that British Columbia has assumed the position of a gold-exporting colony, and that numerous parties of gold-seekers from the Pacific Slope have already passed to the east side of the Rocky Mountains, and invaded the Saskatchewan valley, like the Indian of American pre-historic times, coming from the west.

From private inquiries which have been made to me recently, I am impressed with the conviction that many of the most prominent citizens in Minnesota are fully alive to the vast importance of the Winnipeg and Saskatchewan districts, and they will spare neither energy or money to continue and increase their commercial intercourse with them. On the boundary line, their military post, Pembina, 65 miles from Fort Garry, is now occupied with United States troops, numbering 350 men. While these will insure the preservation of order among the Indian tribes which

have so recently disturbed the frontier settlements in Minnesota, they will familiarize the Red River people, now numbering 10,000 souls, with all the advantages of commercial intercourse.

I have refrained from making any allusion to the fur trade, which has so long been a source of wealth to the Hudson's Bay Company. The districts in which that lucrative trade can be carried on with increasing profit under judicious management, lie wholly beyond the area whose resources form the subject of this paper. With prompt and energetic action on the part of those who in a measure rule the destinies of this valuable portion of the empire, Central British America will rapidly acquire an important commercial and political status, independently of its being the high road for postal and telegraphic communication between the Atlantic and the Pacific, lying wholly within the jurisdiction and influence of British rule.

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## THE SANDWICH ISLANDS.\*

### NUMBER IV.—KILAUEA.

H. B. A.

KILAUEA, the largest active crater in the world, is in the district of Puna, on the south-east coast of Hawaii, and distant from the Bay of Hilo about twenty-nine miles. It has been scientifically described by the officers of the United States Exploring Expedition of 1840, and frequent accounts have been given by visitors at various periods since, no two of which are alike, so frequent and radical are the changes in its appearance.

The ascent, although fatiguing, is not a matter of extraordinary difficulty, and is made in a single day, the elevation being only about four thousand feet above the sea. The native guides, walking beside the horses of visitors, can reach the crater in about twelve hours, although they carry heavy loads, swung in calabashes on poles—*a la Chinois*.

The road for the first three miles from Hilo leads among ferns of all shapes and sizes. There is a collection of these ferns in the Museum of Oahu College at Punahou, near Honolulu, which embraces upwards of one hundred and fifty specimens. The variety and size of the ferns on the road to Kilauea, and the tropical luxuriance of their growth, suggests the rapidity with which the soil of lava islands has been formed. Myriads of these plants die annually, and go to enrich the soil, and as they die a

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\* The articles, which we have published, of this series (full of valuable information pleasantly conveyed) have been, as it were, preliminary to an article we shall publish in our next number, on the "Sandwich Islands and their Sugar Crop," to which we would call particular attention. The interest of the United States in the Hawaiian Islands must increase each succeeding year as their capabilities and resources become better known, and the importance to our Pacific Coast of the position they hold is more fully realized.—ED. "HUNT'S MERCHANTS' MAGAZINE."

fresh growth is following from their roots, so that the face of the country is always green, while below the leafy sward, that at the distance of six or eight feet from the ground is spread over everything, are vast masses of decayed and decaying vegetable matter. The growth of ferns has evidently been the first throughout these lava islands, although in the older and richer portions they have been supplanted by the grasses. As an instance of the rapidity and spontaneousness of their growth it was noticed that after one of the great eruptions of Mauna Loa, in 1856 or 1859, I am not certain which, the lava was two years in cooling, and yet in the fourth year signs of vegetation were visible. All the older lava streams are covered by a growth of ferns, only surpassed by this belt around the coast in density.

The most remarkable of the gigantic ferns of this belt are the great tree-ferns, with branches four or five feet long. At the foot of these trees is found a soft, feather-like substance, called *pulu*, which forms an article of considerable trade. It is used extensively in California for bedding; and in 1862, 738,000 lbs. were shipped to San Francisco. Those who have used it, however, are substituting hair or straw on account of the unhealthiness of the *pulu*, which, from its heat, has the same ill effects as feathers, and is popularly thought to increase rheumatism. It has been recently exported to China in considerable quantities, and it is not improbable that as the demand from California decreases that from China will increase. The natives are largely engaged in gathering it, and are employed more or less by the Chinese merchants of Honolulu. The Chinese are a singular people, wherever in the East there seems to be an opening for trade in their peculiar staples, there they are to be found collecting necessities or luxuries for their countrymen at home, and generally are very successful merchants. In all the islands of the South Pacific they are numerous, in Australia there are large communities of them. In San Francisco they have monopolized the trade in several articles of commerce, among which is rice, and none dare compete with them in importing it. They manage to buy it cheaper, and are satisfied with so much smaller profits, that they sell it for less than it costs the American merchant to land it in California. In the Sandwich Islands they are quite numerous, the retail trade of the islands being almost entirely in their hands. Some of them are successfully engaged in sugar-planting, and they have the shrewdness to avail themselves of the best kinds of American machinery. Quite recently, one of the most successful left the neighborhood of Hilo to return to China, taking with him all the machinery of his mill, with the intention of putting it up somewhere in the interior of the Empire. Men like this will accomplish more in introducing the comforts and improvements of civilized life into China than all the efforts foreigners may direct to that end. His success is of the greater importance from the fact that very large quantities of sugar are made in the Southern Provinces, but at an enormous waste of molasses from evaporation, arising from the use of very imperfect machinery. The sugar of Swatow, the great port of export for that commodity, is damp and black with molasses. With the centrifugal machinery for drying it could be made equal in color to the best. As an instance of the ability and secrecy with which they conduct their trade, it is noticed that many of the natives of Hawaii are engaged in collecting a fungus which grows on decaying



trees, and which the Chinamen ship in considerable quantities (300,000 lbs. a year), and yet none of the white merchants of Honolulu have ever shipped a single pound, nor can they tell what profit the Chinamen obtain for the article; their only knowledge being that it is used as an article of luxury, like the bird's-nests of Malacca, and the shark's fins and fish-maws collected by Chinamen on the African coast, or the sea-slug *beche-de-mar*, obtained in the Islands of the Pacific. Indeed, throughout the world, trade in these peculiar commodities is entirely in the hands of Chinese, they alone possessing the necessary facilities for selling them in the interior of the Empire.

Leaving the region where ferns are the only growth, the road to Kilauea winds through a belt of forest land, about four miles broad, which skirts the Eastern side of the island, and runs partially around the Southern and Western. Here the road is but a sheep-walk, leading often through such a dense growth of weeds and ferns, ten or twelve feet high, as to make it difficult to see anything of the surrounding forest. Wherever glimpses are caught of it, the eye is pleased with the strange and wonderful tropical plants that spring up on every side. Conspicuous among them is the beautiful ohia-tree, which looks like one of our own hickories, except that it is covered with a brilliant red flower, and clusters of snake-like vines run up the trunk. The tutui, or candle-nut tree, is almost as common as the ohia, and quite as beautiful in its way. Many of these are transplanted to the towns and villages, where they make excellent shade trees, not attaining any great height, but spreading like the larger kinds of cherry or chestnut. From the nut of this tree, as its name implies, the natives make their tapers, by stringing them like beads. Another curious tree, very abundant in these forests, is the lauhala-tree, the roots of which grow above ground for four or five feet, being with the trunk as gnarled and ugly as those of any tree in existence. The leaves are shaped like rushes, and stand out around the fruit like the cloak of a New Zealander, or a Chinese Coolie, and are equally impervious to the rain. Commend us to a lauhala-tree in times of thunder-showers. Occasionally the Pride of India, the Koa and the Sandal-wood are seen, but not often, especially the last, as the active demand for it in former times did not allow many to escape. The cocoa-nut palm and the wild banana-tree are sometimes found, the former shooting upwards with a curve in its earlier growth like that of a rocket in its first flight, and the latter attaining a height of twenty feet or more. It is singular that the African Palm ("La Palma real," of the Spanish West Indies,) has not been introduced on these Islands. There is only one specimen, I believe, and that occurs in a private garden in Nuaanu Valley. Tropical scenery scarcely seems complete without this lordly tree. A plant, which cannot be correctly styled a shrub, yet which never attains to the dignity of a tree, the Ti-plant, is quite abundant, especially on the out-skirts of the forest, furthest from the coast, where the road leads through wild plantations of them, two miles or more in extent. The roots of this plant are said to be very nutritious, and are cooked by the natives, although not a favorite dish with them. In times of famine, which, Heaven help them! will occur in the most favored lands, if man is lazy and improvident, the roots of the Ti-plant have saved many from starvation. The general use, however, is to obtain an intoxicating liquor like arrack, manufactured somewhat in

the same manner, the effects of which rival those of opium in lasting injury to the system. A wild plantation of these bushes without branches is a pleasing sight; the stalk is of the thickness of two fingers, rough and mottled like calamus root, and growing nearly straight to the height of eight or ten feet. Here it bursts out into leaves, broad and glossy, which hang gracefully like those of the palm-tree.

After leaving the forest and its belt of Ti-plants, the character of the road changes, and leads through a tract of country, several miles in extent, where lava-rock is the only noticeable feature. This rock, although a dozen miles from the volcano, shows signs of having been formed by some overflow within the century. Those who have examined the country critically say that it has come from Mauna Loa, on the side of which Kilauea is situated. It has all the waves and eddies of a moving mass distinctly marked on its surface. In many places appear pools and eddies, where a level space has allowed a short accumulation; while, further on, the stream has leaped down some precipice, and crusted the rock it passed over, as ice will form on some northern waterfall. These signs warn the traveller that he is approaching the volcano, but he will look in vain for any other sign of its proximity. If the orthodox school-boy idea of a volcano, such as geographies for a century past have impressed on all minds—that of a cone, smoking at the top like a burning hay stack—be present to his imagination, he will surely be disappointed, for the road carries the visitor within a hundred yards of the brink before he is aware of the proximity of the crater.

It is a sight to be remembered.

Looking below, almost under the feet, is a vast black lake, 800 feet beneath, and bounded by lofty walls of lava-rock. This lake stretches for miles, and the opposite walls, nearly four miles away, bound the horizon. If seen for the first time at night, under the dim light of the moon as she bursts from time to time through the clouds, the lake appears boundless; its outline is magnified until it seems to swallow up the landscape, and the distant shores appear as if they were the natural horizon. Miles and miles away there is a bright, red, and fitful light cast on the clouds from that awful pit, for which the ancient Hawaiians had such a dread as the abode of the goddess Pelé. Now and again the fires leap up and illuminate the great lake for a long distance from the pit, but unless Pelé is unusually active, the surging of the flames, apparently low on the black surface of the lake, and the glow in the clouds, seem so far away that it is impossible to say how bright or extensive these fires may be. A smell of sulphur is noticeable from the sulphur-pits only a few rods from the spot where the road approaches the volcano, and even around us as we stand on its brink, little puffs of smoke come up from the ground. Down in the black lake, wherever the moonlight will permit them to be seen, little columns of smoke are noticed oozing upwards through the cracks in the crust of lava, and forming in places a white veil over the black mass. Viewed at any time, and from any point of sight, the prospect is weird and very "uncanny," as the Scotch say, but it is particularly so at night, especially to one unacquainted with the mysteries below.

With the morning everything is changed. The outline of the basin; the sulphur banks on the walls; the black lake beneath, its cakes, like those of a frozen river, its mountains and single peaks smoking like young

volcanoes; the great pit of fire itself, and the cloud of smoke always rising from it, are plainly distinguished; and when the mind can grasp the outline entire, it is not difficult to examine and understand the minuter details one by one. The first thing noticeable by anyone at all familiar with the descriptions of former travellers, is that the "black ledge" has entirely disappeared, or else that it is of monstrous size, embracing all that is visible from above. The former supposition is the correct one; in some eruption subsequent to 1840, or as the result of a series of eruptions, the crust which was called the Black Ledge has sunk or fallen in, and the liquid lava below has risen to meet it, and on cooling at this height has left the present lake, filling the bowl of the crater.

A descent into this bowl shows that all this mass of black lava has been subject to great upheavals. When the surface of the fiery lake sunk to its present level, it was tremendously agitated, if we may judge by the confused position of stupendous slabs of lava. It is broken into fantastic shapes on every side. Here, a chain of hills, trap-rock among the lava waves, runs from North to South; there, a river seems to have flowed between fixed banks, its surface is turbulent with great flat cakes like black ice, broken up in the sinking of the lava-flow below, standing on end and tossed into every possible position. In whatever direction one wanders on this black prairie he is reminded that beneath are the eternal fires. Every crevice has its little curl of smoke, like that rising above a spring on a frosty morning; and as we approach the actual lava-lake, after a brisk walk of more than two miles, volumes of smoke roll up on the right hand, where, as it blows aside, a yellow coating of sulphur is seen on the lava, while out of the dense clouds come strange noises, groans and fearful shrieks from escaping steam, suggestive of the torments of the damned, as when the angel in Revelations applies the key to the bottomless pit. The lurid fires, leaping up before us, seem as if they might come from hell, so horrible suggestive is the whole region of MILTON's description of the fiery abode of Satan. The Devil himself would roast in Kilauea.

The natives give the name of Kilauea only to the burning lake, scarcely two hundred yards across, where the molten lava is tossed about as in a boiling pot. It is possible to approach within fifty feet of the rim, although at that distance the heat is oppressive, and to look down upon the angry mass. Its surface, about thirty feet below our stand is covered with a light grey scum, wrinkled like a wasp's nest, and cracking into hideous waves as the mass is pressed against the banks at either side alternately. It is always in motion, and as it retires from one bank to press heavily upon the other, seams of bright molten lava are seen between the waves. When the slowly-moving mass crowds too powerfully upon the bank, up springs the cherry-red lava, shooting like a fountain twenty or thirty feet into the air, tossing its viscid spray upon the black shore of the crust that encroaches over the basin. Again and again, without warning, except in the angry roar with which it tosses aside the scum, a great column of fiery heat appears, now in the centre, now at the rim of the basin. The thick, pitchy spray often cools in the air, and can be seen floating on the wind in glassy fibres, like thistle-down, long and exceedingly fine. This is found upon the outer banks, and is well-known as Pele's hair. If the wind blows hard there is generally a bright line of fire skirting the edge of the lava-crust, overhanging the basin. This crust



or rim is fretted by the action of the tossing lava into caves with gothic arches, glowing like an iron forge when the men are "digging out the loup," and with a red sea beating up against their sides and fantastic roofs. Sometimes a great piece of the crust, where the fire has undermined it, breaks off, and plunges through the grey scum into the red lava with a sullen roar and a mighty disturbance of the surface of the lake, followed by numerous columns of fire shooting aloft. The whole effect is grand beyond description; grandest in its fearful suggestions of what *might be* when such a fiery lake fills this crater of miles in extent. Many who visit the place are so fascinated by these wonderful fires—always in motion, never the same—that they spend several nights in succession on the very brink. Small need for a blanket there, unless it were a wet one! Although the air is more or less filled with the sulphur fumes, if the wind is from the basin and tolerably fresh, the smell is not unpleasant, but anywhere in the lee of Kilauea the air is horribly oppressive; people attempting to pass behind and around the lake have been nearly stifled by the vapors.

Surrounding the basin at every point of the compass, and not far from it, are cones, smoking viciously at the top and crusted with flower of sulphur. On near examination the bright eye of the lava is seen furtively lurking in the sulphur chambers, and the crusted lava at their base is sure to be hot to the touch. In fact the whole surface of the crater is more or less warm, and burns the soles of boots so as to ruin a pair in a few hours. The vitreous lava cuts like a knife, as many a man, too eager in breaking off specimens with his hands, has learned to his cost. Some of these cones assume the most fantastic shapes. There is one not half a mile from the fires of Kilauea which is as large as a church, and at a distance looks like one. Viewed from the bank, at the distance of two miles, it has a perfect resemblance to a Gothic Cathedral, with a graceful spire, and all the grotesque yet delicate fretwork which distinguishes that order of architecture. In fact it is the only strictly Gothic Cathedral on the islands, notwithstanding that the Puseyite Bishop of Honolulu has seen fit to dignify by that name an unsightly brown building, painted to resemble freestone, and scarcely large enough to accommodate his choir.

Kilauea is reported by the people of Hilo to have been quite active in March of last year (1863), and in June it was still moderately so. The lake had filled up, and a crust had formed over it, so that then it occupied comparatively a small area, and the impression left upon the mind that another extensive eruption could not be far off was very strong. It has often been thus choked up by the crusted lava, and then suddenly burst out afresh with redoubled fury, but the area of the eruption seems to have been more circumscribed at each successive outbreak, for nothing like the scene of grandeur described by Mr. ELLIS, and visitors following him within a few years, can be found there at present, and until another eruption, filling the entire crater, shall occur, a repetition of what they saw cannot be expected. It is questionable whether Kilauea has not found another outlet to the sea, as a small island of rock has appeared off the S. E. point of Hawaii, a mere patch of rock, to be sure, but which has grown up lately.

Still, Kilauea remains the most wonderful volcano in the world,—in constant operation since its discovery, at times on the grandest scale.



The native traditions do not go back to a time when Kilauea was silent, although they undoubtedly refer to a time when Mauna Kea and Mauna Loa were more active, and threw out vast fields of lava. Kilauea is also wonderful, as almost the only volcano where the liquid lava and its wonderful action can be viewed, within a few rods with perfect safety, in the bowl of a crater over four miles in diameter.

## COMMERCIAL LAW.—NO. 14.

### THE STATUTE OF LIMITATIONS.

THE statute of 21 JAMES I., chapter 16, commonly called the Statute of Limitations, was passed in England in 1623. Among its provisions, it enacts that all actions of account and upon the case, (which include nearly all the actions which can be brought for indebtedness or damages,) *provided* they do not concern the trade of merchandise between merchant and merchant, their factors or servants, all actions of debt grounded upon any lending, or contract without speciality, (that is, contracts without seal,) and all actions for arrearages of rent, shall be commenced and sued within six years next after the cause of such actions or suit, and not after. In few words, all claims which do not rest on a seal or a judgment must be sued within six years from the time when they arise.

The provisions of this statute were copied, without much important variation, in the statutes of all our States; and upon them, as they are explained and in some respects materially modified by adjudication, the law of limitation rested, in England and in this country, until 1827, when statute of 9 GEORGE IV., chapter 14, commonly called Lord TENTERDEN'S Act, was passed. This statute, after reciting the statute of JAMES, provides, in substance, that if a debt or promise be once barred by the Statute of Limitations, no acknowledgment of the debt or new promise shall renew the debt and take away the effect of the statute, unless the new promise is in writing, and is signed by the party who makes the promise. But this new statute expressly permits a part payment either of principal or interest of the old debt to have the same effect as before. And this statute also provides, that if there be joint contractors or debtors, and a plaintiff is barred by the statute against both, but the bar of the statute is removed as to one by a new promise or otherwise, the plaintiff may have judgment against this one, but not against the other. And statutes substantially similar have been passed in Maine, Massachusetts, Vermont, New York, Indiana, Michigan, Arkansas and California.

#### CONSTRUCTION OF THE STATUTE.

For the law of limitation there is a two-fold foundation. In the first place, the actual probability that a debt which has not been claimed for a long time was paid, and that this is the reason of the silence of the creditor. But besides this reason, there is the inexpediency and injustice of permitting a stale and neglected claim or debt, even if it has not been



paid, to be set up and enforced after a long silence and acquiescence. In truth, these two reasons mingle; but as one or the other prevails, its effect is seen in the construction of this law, and in its application to cases.

If, for example, the statute is considered as only a statute of presumption, or, in other words, if it is supposed to say that a debt which is six years old shall not be demanded, because the law presumes that so old a debt must have been paid, it is obvious that, when evidence is offered to do away the effect of the law, courts will look at this evidence mainly to ascertain whether it rebuts this presumption, by proving that the debt still exists. In this view, and for this purpose, any acknowledgment or admission of the mere existence of the debt, by the debtor, would be sufficient to do away with the law. Thus, Lord MANSFIELD said, long ago, "The slightest acknowledgment has been held sufficient to rebut the presumption that an old debt has been paid; as saying, 'Prove your debt, and I will pay you'; 'I am ready to account, but nothing is due you'; and much slighter acknowledgments than these will take a case out of the statute." If, however, courts regarded the statute rather as a statute of repose, or, in other words, as intended to prevent the enforcement of stale claims, whether they were paid or not, then it is obvious that a mere admission that the debt was legal and remains unpaid, amounts to nothing. The law says, it has remained unpaid so long, that it is too late now to bring it forward. But if the debtor is willing to waive the protection of the law, and not only acknowledges the debt, but promises to pay it, there is no reason why he should not be held upon this promise.

Between these two views it may be said that the courts have fluctuated from the beginning. As soon as the statute was passed, whenever it was pleaded by the defendant in bar of the action, if the plaintiff sought to remove this bar by any words of the defendant, he was obliged to allege "a new promise" made by the defendant. This rule of pleading tends to show that, at the beginning, the statute was regarded as a statute of repose, which could not be set aside by a mere *acknowledgment* that the debt was unpaid. But although the rule itself indicates this, the practice of the courts took the opposite direction. An impression prevailed, not perhaps at the beginning, but early, and continued long, that the statute itself was not to be favored; that a resort to it was generally a dishonorable attempt to escape the payment of a just debt; and that the court should give its aid to the creditor who endeavored to do away the effect of this law. Such language as this was not used, but such was the practice; and, accordingly, any sort of acknowledgment, proved in almost any way, was permitted to remove the bar of the statute.

At length, however, a different, and, as we think, a far more just and rational view, prevailed. It began to be admitted by the profession and by the courts, although it never has been, perhaps, by the community, that it was a necessary and beneficial law, and should be, if not favored, at least applied fairly and rationally, and permitted to do its very useful work in suppressing stale claims. These views are now very general, both in the English courts and in our own. One effect of them was Tenterden's Act, which we have given already, and which, as may be seen, guards against the admission of loose and uncertain testimony in proof of a new promise.

Before inquiring into the rules of law which now apply to the case of

an acknowledgment or new promise, it should be remarked that a prescription, or limitation, of common law, much more ancient than the statutes above quoted, is still in full force. This is the presumption of payment after twenty years, which is applicable to all debts; not only the simple contracts to which the Statutes of Limitation refer, that is, contracts which are merely oral, or which if written have no seal, but to specialities, or contracts or debts under seal or by judgment of court. Of these it will not be necessary to speak here, excepting to remark, that in one or two of our States the Statute of Limitation excepts a promissory note which is signed in the presence of an attesting witness, and is put in suit by the original payee, or his executor or administrator; such a note in those States, which we believe are now only Maine and Massachusetts, may be sued at any time within twenty years after it is due. Bank-bills, and other evidences of debt issued by banks, are everywhere excepted from the operation of the statute.

#### THE NEW PROMISE.

The first question we propose to consider is, what is the new promise which suffices to take a case out of the statute. If the promise be made, the former debt, although not in itself enforceable, is considered a sufficient consideration for the new promise. This might be made as well orally as in writing, until Lord TENTERDEN'S Act. But although this act requires, as matter of evidence, that the new promise shall be in writing, it does not affect at all any question respecting the character or sufficiency of the new promise; they remain to be decided by the same principles, and in the same manner, as before.

The first thing to be said is, that now, by the general consent of the courts of this country and of England, a mere acknowledgment, which does not contain, by any reasonable implication or construction, a new promise, and still more, if it expressly excludes a new promise, is not sufficient. In the leading American case upon this point, before the Supreme Court of the United States, it was proved, in answer to the plea of the Statute of Limitations, that the defendant, one of the partners of a firm then dissolved, said to the plaintiff: "I know we are owing you"; "I am getting old, and I wish to have the business settled"; it was held that these expressions were insufficient to revive the debt. So, in New Hampshire, in an action on a promissory note, the defendant, on being asked to pay the note, said "he guessed the note was outlawed, but that would make no difference, he was willing to pay his honest debts, always." As he did not state in direct terms that he was willing to pay the note, this was held not sufficient to revive the debt. A new promise is not now implied by the law itself, from a mere acknowledgment.

Whether an acknowledgment of an existing debt is sufficient to take it out of the statute, or, in other words, whether it carries with it a promise to pay that debt, is a question of law for the court, when it is only a question as to the legal meaning and effect of the words used; for this would be a mere question of construction, which is always a matter of law only. But if the question is as to what words were used, and what was the intention of the parties to be gathered from the words and acts, this is a question of fact, and it is for the jury to determine.

The new promise need not define the amount of the debt. That can be



done by other evidence, if only the existence of the debt and the purpose of paying it are acknowledged. Still, the new promise must be of the specific debt, or must distinctly include it; for if wholly general and undefined, it is not enough. A testator who provides for the payment of his debts generally, does not thereby make a new promise as to any one of them.

If the new promise is conditional, the party relying upon it must be prepared to show that the condition has been fulfilled. Thus, if the new promise be to pay "when I am able," the promisee must prove not only the promise, but that the promisor is able to pay the debt. Even if there seems to be a promise wholly unconditional and unqualified in its terms, it is competent for the defendant to show, by the attendant circumstances or other proper evidence, that it was not intended, nor understood, as an acknowledgment or a promise. On the other hand, if the expressions in themselves are doubtful, the plaintiff may make them clear, and show by evidence that they meant and were a promise.

As the acknowledgment should be voluntary, it follows that those made under process of law, as by a bankrupt, or by answers to interrogatories which could not be avoided, should never have the effect of a new promise.

A doctrine has prevailed, and perhaps has at present the weight of authority in its favor, according to which every new item and credit in a mutual and running account is an acknowledgment, by the party making it, that the account is open and unsettled, and so draws after it all preceding items as to have the same effect as a recognition of them, and a promise to pay the balance when that should be struck. This doctrine grew up, we think, in those days when courts disliked the Statute of Limitations, and sought opportunities, or at least favored attempts, to defeat it. Such is not the view of courts at present; and we should say that the general principles now prevalent would eventually limit this doctrine to cases where the account was mutual and open, and there was evidence that the items relied upon were intended to be charged in offset, so as to have the effect of a part-payment. But the law on this subject is not now quite clear.

#### PART-PAYMENT.

A part-payment of debt is such a recognition of it as implies a new promise; even if it be made in goods or chattels, if offered as payment and agreed to be received as payment, or by negotiable promissory note or bill. Thus, in England, where one was sued for money due for a quantity of hay, and pleaded that it had been due more than six years, which was a good defence, the plaintiff proved in reply that defendant had given him within six years a gallon of gin as part-payment for his debt; and it was held that this took the case out of the Statute of Limitations, and the plaintiff recovered. But a payment has this effect only when the payment is made as of a part of a debt. If it is made in settlement of the whole, of course it is no promise of more. And a bare payment, without words or acts to indicate its character, would not be construed as carrying with it an acknowledgment that more was due and would be paid.

If a debtor owes several debts, and pays a sum of money, he has the



right of appropriating that money as he pleases. If he pays it without indicating his own appropriation, the general rule is, that the creditor who receives the money may appropriate it as he will. There is, however, this exception. If there be two or more debts, some of which are barred by the statute, and others are not barred by it, the creditor cannot appropriate the payment to a debt that is barred, for the purpose of taking it out of the statute by such part-payment. If a debt consists of both principal and interest, a payment specifically on account of either of these parts will take the remainder of that part, and the whole of the other part, out of the statute. If mutual accounts are settled, and a balance struck, all the items which are within the admitted account are so many payments, and may have the effect of part-payments in taking a debt towards which they go out of the statute. So, a payment for a creditor to a third party on account of a debt due from the payer to the creditor, is the same thing as a payment to the creditor.

The Tenterden Act requires that the new promise should be in writing; but provides also, as we have seen, that nothing in it shall alter, or take away, or lessen the effect of any payment of any principal or interest. This, therefore, remains a new promise, as before.

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#### ON THE ACTION OF OIL-WELLS.\*

By PROF. E. W. EVANS, MARIETTA COLLEGE.

THE phenomena exhibited by oil-wells suggest various problems, the discussion of which may be of scientific as well as practical interest. The facts on which the following remarks are based have been collected chiefly from the history of different wells in the coal regions of Southern Ohio and West Virginia.

It seems certain that the principal supplies of petroleum are not diffused between the planes of stratification, but are collected in cavities more or less sunken in the strata, whence it is less liable to be carried away by running water. Prof. E. B. ANDREWS has shown, in an article published in this Journal, July, 1861, that it is common to find large quantities in places where there are marks of disturbance and displacement of the rocks. The cavities have probably been caused sometimes by uplifts and sometimes by erosion and the dissolving action of water; but whatever may be their origin, they are not usually of great horizontal extent. It is seldom that two neighboring wells strike oil at the same depth, whether the strata be horizontal or dipping. It is one chance out of many to strike oil at all, even in neighborhoods where it exists in abundance. The drill, as it enters the cavity, sinks variously from four or five inches to as many feet, sometimes sticking fast, as if between the oblique sides of a narrow fissure. But there are facts connected with the history of oil-wells, particularly their intermittent action and their

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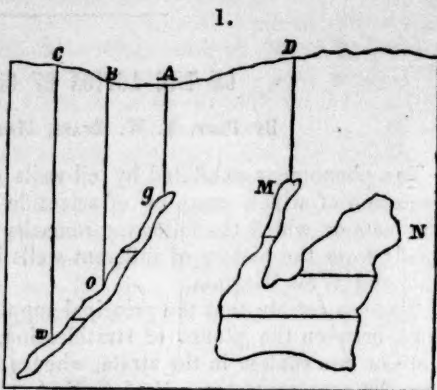
interference with one another, which serve to show the existence, in many cases, of systems of these cavities connected together by channels of communication more or less free, running sometimes along the strata and sometimes across them. The productiveness of a well depends on its entering either one of the main reservoirs or some of its important connections.

Let us begin with the most simple case, that of a single or isolated oil-cavity; of which a cross section is represented by *gw*, fig. 1. Every collection of oil is accompanied with varying quantities of gas and water, the gas occupying of course the top of the cavity and the water the bottom, according to the order of their specific gravities. First suppose that a well is bored at A, so as to enter the gas. Being in a high state of tension the gas escapes, sometimes with explosive violence, carrying out with it whatever water there may be collected in the boring. If water enters the cavity freely, as is usually the case, the oil, floating on its surface, is soon driven upward to the mouth (i. e., lower end) of the tube; it may then be pumped out till the line of division between it and the water rises to the mouth of the tube; after which, mixed oil and water will be drawn. But it often happens that the water rises faster than it can be thus exhausted, and the oil, driven into the top of the cavity, is lost, until the water is reduced

by machinery of greater working power. But as it cannot be reduced below the mouth of the tube, unmixed oil cannot again be obtained from the well. In all wells from which the gas has escaped, there is ultimately a saving of work if the oil is pumped out as rapidly as possible before the intrusion of water. Secondly, suppose that the boring is at B and enters the oil. In this case, the oil rises in the tube to a height depending on the

tension of the gas above it; a mode of action which is illustrated by the familiar apparatus called the fountain with condensed air. Sometimes it is thrown into the air a distance of 30 or 40 feet, and large quantities wasted. If the oil continues to be ejected till its surface in the cavity descends to the mouth of the tube, the fact first becomes known by a gurgling and spurting action, and the gas, or the greater portion of it, escapes, after which the pump becomes necessary, and the same series of actions take place as in the first case. But if the gas reaches its equilibrium with the hydrostatic pressure before the oil is reduced so low, we may then pump out the oil till the water rises to the mouth of the tube, after which we shall obtain mixed oil and water as before, till the whole supply of oil is exhausted, provided the pump is of sufficient working power to prevent interruptions by the too rapid rise of the water.

Next suppose that the boring is at C and enters the water. If the gas has sufficient tension, water is raised until its surface in the cavity de-



scends to the mouth of the tube, then mixed oil and water is obtained, then pure oil, after which the same circumstances exist as in the second case. It must not be inferred, however, that when the water is not thrown to the surface there is no oil. It may happen that the pressure of the gas will raise a column of water only part of the way up the boring, and yet the well be found productive. Hence no considerable quantity of water should be passed without ascertaining by reducing it with the pump whether there is oil confined above it in some side chamber. The Shattuck well on the Little Kanawha had to be drained of water with a steam pump for two weeks before oil was obtained; but after that it yielded abundantly.

Some varieties of action are to be accounted for on the supposition that there are, in the same cavity, different collections of gas separated by a partition descending from the top. Such a cavity is represented by MN, fig. 1. A well enters the gas chamber M. The gas escapes with violence, and yet the oil immediately begins to flow in a continuous stream over the top of the boring, and is perhaps projected in the form of a jet to a great height, by the pressure of the gas in another chamber N, of the same cavity.

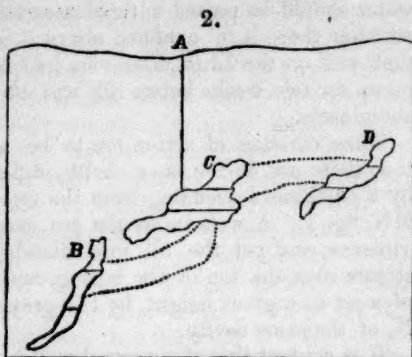
It is evident that if a second well be sunk so as to enter the gas in the chamber N, the oil in M will immediately sink to the level of that in N, and be lost to the first well; a mode of interference which sometimes occurs, when two wells are quite near together.

Thus far I have considered only isolated oil-cavities, or those which, when exhausted, are not replenished to any considerable extent from other sources. In general these run their course in a short time, and yet they sometimes yield very large quantities of oil.

There is a second class of wells, in general more productive, which exhibit the same phenomena at first, but as often as they are exhausted are replenished again, and repeat a certain series of actions indefinitely, and with remarkable regularity of time. This is to be explained by supposing that they are connected with other reservoirs by slight channels of communication, whose capacity for replenishing is less than that of the tube for exhausting. Let C, fig. 2, be an oil cavity having connections with two other cavities, B and D. Suppose that a well A enters the oil in C. After this well has thrown out oil, and perhaps afterward water, by force of the condensed gas, it comes to a stop. Then owing to the diminished tension of the gas in the enlarged space in C, the gas and oil in B and D force slight passages, represented by the dotted lines, into C, until the gas in this cavity again becomes sufficiently compressed to raise oil and water successively; after which the well comes to another stop\* until it is replenished with oil and gas as before; and the same process is repeated an indefinite number of times. The Newton well, on a branch of the Little Muskingum, a few miles from Marietta, repeats this process (with some escape of gas) at regular intervals of about half an hour, expelling about a barrel of oil each time. A noteworthy fact connected with this well is that when it stops it is necessary to pump out a little water in order to start it again; then the oil issues spontaneously. This is to be explained as follows. The pressure of the gas is not quite sufficient to raise the water to the surface; but the position of the mouth of the tube is such that a few strokes of the pump suffice to reduce the sur-

face of the water in the cavity below that point. Now a column of oil will be raised by a given pressure so much higher than a column of water as its specific gravity is less. In this case it is raised not far from a fourth higher (the specific gravity of the oil being .816;) and the difference is sufficient to make it flow over the top of the tube. Examples of this kind are common.

The well in the figure is represented as having but a few connections, sufficient perhaps for the purpose of illustration; but it is probable that these lines of slow communication are usually numerous; the gas and oil, like the water, forcing their way in through a multitude of pores and slight crevices, until a state of equilibrium is gradually reached or approximated to, as mercury forces its way in through the pores of wood into the exhausted receiver of an air-pump. Sometimes it happens that the cavity is filled with sediment of clay and sand by these little streams, and the well becomes inactive.



The class of wells here described may be distinguished from others as intermittent wells. The finding of one of these may be regarded as a certain sign that there are numbers of oil cavities near together in the same locality. Especially if it yields copiously for months in succession, as often happens, without any material diminution in quantity, or increase of the intervals between the successive yields, the rocks in its neighborhood may be presumed to contain rich supplies of oil that may be directly reached.

On Oil Creek in Pennsylvania the greatest quantities of oil are found in the same horizontal stratum of sandstone. It would seem that this rock is very porous, and perforated like a honeycomb with numerous cells and fissures containing petroleum. The history of many of the wells is as follows. When oil is entered, the gas begins to raise it up over the top of the boring, increasing gradually in force until it projects it into the air, often to a height of 40 or 50 feet, then alternately diminishing and increasing in force at regular intervals, but without any cessation in the flow for a long time. These variations in the force of the gas (the "breathings of the earth," as they are called,) are to be explained on the same principle as before, by supposing that as the tension of the gas is relaxed by the removal of oil, the gas and oil from other cavities around rush in through the pores and slight fissures till a certain maximum tension is reached, and the influx ceases; then by the expansion of the gas already in the chamber the oil continues to come up, but with a diminishing flow, until a relative vacuum is again created; after which the influx is renewed and gradually increases as at the beginning. These regular alternations vary in different wells from two or three times a day to as many times an hour; the intervals, however, gradually increasing in length as the supply of oil is diminished; unless, as sometimes happens, new



communications are forced, and the well, deriving new supplies, starts off again with a new period. It often happens that the same well has two periods; one of variation in the flow, and another of cessation, consequent on the escape of gas.

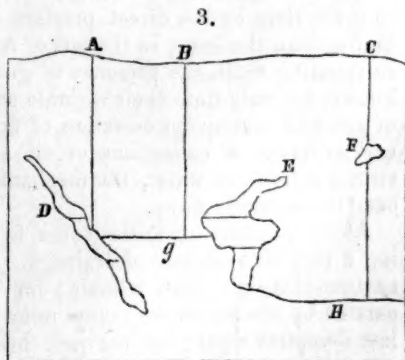
A more uniform flow may be secured by making the orifice at the mouth of the tube smaller. This is often desirable in order to prevent the escape of gas by the exhaustion of the oil in the cavity down to the bottom of the boring. Sometimes such a quantity will thus rush out, before the oil raised up by the water, closes the passage again, as not only to render the pump necessary after that to raise oil, but also to diminish materially the influx of oil from other cavities by reducing the pressure of the gas in them. Another expedient sometimes resorted to, when the spontaneous flow of oil becomes slight, is to stop up the boring till another "head of gas," as it is called, accumulates. But the stoppage should not be continued long; for instances are known where the gas has in consequence forced a way from its new channels in other directions, and found vent in other wells.

It is not an uncommon thing for intermittent wells to throw out at first 300 or 400 barrels a day, or to yield in all as much as 20,000 barrels. They sometimes run two or three years before exhaustion. The productiveness of the Lewellyn well on the Little Kanawha greatly exceeded these figures.

It is evident that if a second well were sunk so as to enter the cavity B or D fig. 2, the well C would lose one portion of its supply of gas and oil, and be to this extent interfered with. Sometimes a very productive well thus cuts off the main supplies of a number of less considerable ones in its neighborhood, or, if the first sunk, it is itself tapped by them.

But some of the most marked cases of interference that are known, show the existence of a third class of oil cavities, connected with one another by perfectly free channels of communication, so that when the equilibrium between them is disturbed, it is immediately restored. Fig. 3 will serve to illustrate. A well A enters the cavity D finding oil. Another well B is bored so as to enter an open channel *g* between the two cavities D and E. This will drain oil from A; but if, as in the figure, its mouth is lower than that of A, it can be made a valuable auxiliary to it when the rising water drives the oil into the upper part of the cavity; for it can be used to reduce the water, and thus to keep the oil within reach of A.

Again, a third well C is bored, and passes through a strong current of water, a cross section of which is represented by F. It finally descends to a fissure H, which communicates freely with E and consequently also with D, and interferes with both the other wells by letting in such a head of water as to drive the oil in both cavities above the mouths of the tubes. Pumping the water out of all these simultaneously might bring the oil down again within



reach of that tube at least which enters at the highest point. A better expedient is to stop up tightly the space on the outside of the tube in the well C, just below the stream of water F. This is often effected by lowering a leather bag filled with dry seeds to the required depth. As water penetrates it, the seeds swell and close the passage.

On the Little Muskingum there are four or five wells (from 100 to 200 feet apart), so connected together as to illustrate both modes of interference shown by fig. 3. Had the well B entered the gas in E, it would have interfered with A by causing the escape of this gas; a case analogous to that mentioned before, where there were supposed to be two gas chambers in the top of the same cavity. After this the irruption of the water from C would have temporarily assisted B by raising the oil in E to the mouth of the tube.

Examples differing in details might be multiplied indefinitely. I have aimed only to point out in a general manner the different modes of action, and the hypotheses on which they are to be explained.

In the foregoing illustrations the quantity of gas has been supposed considerable. In many cases however it is so slight that the pump has to be used throughout. Yet wells of this kind often partake of the intermittent character to some extent. As it is not usual to work them at night, they begin each day with a new accumulation, which gives them a certain regularity of daily action often considered mysterious. There is a well a few miles from Marietta which yields oil only for a short time in the morning; when neglected till that time is passed, it is unproductive for the day. This is owing to the proximity of another well, which drains it of its water in the day-time, but by resting at night allows it to be replenished. Wells of small supply often require a certain interval of rest to be replenished, but never exceed a certain amount, however that interval may be extended—the column of oil having reached its maximum height by pneumatic or hydrostatic pressure.

Oil-wells commonly vary in depth from 100 to 800 feet. The deepest are as apt to raise oil to the surface as the shallowest. This indicates a greater compression of the gas at the greater depth, owing doubtless to its connection with higher columns of water. The activity of some wells is increased by rains; others, with less gas, are rendered unproductive till the water can be reduced. It must not be assumed, however, that their connection with subterranean currents is immediate and unobstructed. I know of no instance where there is reason to suppose that the oil is raised to the surface by the direct pressure of a stream of water whose head is higher than the issue, as the jets of Artesian wells are said to be produced. In spouting wells, the presence of gas as the immediate agent becomes known, not only from their variable action, but also from the actual escape of gas, and consequent cessation of flow whenever the oil is reduced to a certain level. If collections of oil had direct and free connection with strong currents of water, the mechanical agency of these currents would bear them rapidly away.

As it is, minute quantities come to the surface with the springs, showing a very slow process of drainage. As an index of the location of oil-cavities this sign is not reliable; for that which issues may have been carried by the streamlets many miles from its source. Gas springs are less deceptive signs; for the gas, being more buoyant than the oil, and

not liable to be carried along by descending currents, is not likely to wander so far before it issues. But the "show of oil" increases in value as a sign with the depth at which it is found. Especially is the finding of large quantities of imprisoned gas, though no oil may be present, regarded as a good indication that there is no oil near.

## COMMERCIAL CHRONICLE AND REVIEW.

FLUCTUATIONS IN GOLD—EFFECTS ON PRICES—PRICES OF DOMESTIC PRODUCTIONS AND FOREIGN IMPORTATIONS COMPARED—THE FALL IN GOLD AND ITS EFFECT ON BUSINESS—THE LOAN OFFERED BY GOVERNMENT AND THE BANK DEPOSITS WITH THE TREASURY—PUBLIC DEBT—RECEIPTS AND EXPORTS OF SPECIE AND PRICE OF GOLD—RATES OF EXCHANGE—PRICES OF UNITED STATES PAPER.

THE events of the last month have been influenced principally by the great fluctuations in the prices of gold, that have tended to unsettle all values prospectively, and create great apprehensions in relation to the possible consequences of a sudden and large depreciation in prices of goods. The combined influence of taxes and currency inflation had carried goods so high as seriously to check consumption. The effect is the more decided since domestic productions have not risen in price as fast as other articles, because, although articles of home production suffered the influence of paper inflation, those manufactured articles composed of imported materials and goods directly imported were influenced also by the premium on gold as well as the paper inflation, and the latter in the double ratio of premium on exchange and premium on gold. The depreciation of the currency is the one general cause of the rise, but the import taxes have added a further element of cost which is not borne by the domestic products. With each advance in the price of gold this becomes more evident, and it is the sign of increased relative difference in prices, which is the main cause of languishing commerce. The Fall trade is very backward, and many dealers are awaiting orders for the reshipment of their goods to more propitious quarters. An ordinary quality of cloth which paid twenty-four per cent duty three years since, now pays four hundred and sixty per cent before it reaches the retailer; a fact which represents so many yards less for the same quantity of farm produce. The operation of the rise on the general market, may be seen in the following table of certain imported articles, showing duties and prices:

	1862.		1864.	
	Duties.	Price.	Duties.	Price.
Coal ..	50	6 50 a 7 00	1 25	25 00 a 30 00
Coffee.....	5	22 a 23	5	47 a 50
Copper.....	2	28 a 30	3½	71 a 72
Raisins.....	5	3 30 a 3 35	5	5 25 a 5 50
Hides.....	1	24 a 25	1	37 a 38
Indigo.....	free.	95 a 1 15	free.	1 60 a 2 10
Iron, pig.....	6 00	27 00 a 28 00	9 00	77 90 a 80 00
Brandy.....	1 25	4 20 a 8 00	3 50	9 25 a 25 00
Salt.....	1½	1 12 a 1 15	2½	3 40 a 3 50
Rum.....	50	1 50 a 2 25	2 00	7 50 a 11 00
Sugar.....	2 00	7 00 a 9 00	3 00	18 50 a 23 00
Tea.....	15	55 a 58	22	1 15 a 1 25
Wine, port.....	60	1 50 a 4 00	1 20	4 00 a 8 50
Total.....	\$11 14½	\$54 36 a 60 28	\$20 27	\$154 20 a 191 45
Average.....		56 12		172 82

These figures give the duties in gold at each period, and the market price of the articles, including the duties at the present time. There must be added to the aggregate duties that the Government receives, the premium which the importer pays for the gold. There must also be added to the prime cost, the premium on gold paid for bills of exchange. The average aggregate prices in 1862 of the articles enumerated was \$56 12, from which deducting the sum of the duties, there remains \$44 98 as the invoice prices, freights and charges also payable in gold. Taking the same data now, we find the cost is as follows :

Cost and charges.....		\$44 98
Add premium on exchange .....		69 71
Add duties.....	\$20 75	
Add gold premium.....	32 16	52 91
Present cost.....		\$167 60
Average market prices as above.....		172 82

This is an advance of two hundred and eight per cent upon the aggregate price of the articles named, the consumption of none of which is especially affected by the operations of war. They are all articles that meet with a regular demand. The advance in price is composed of two elements mainly, viz.: the duties doubled in gold and nearly quintupled in paper, and the depreciation of paper which is marked in the rise of exchange. If we now take from the prices current thirteen staple articles of domestic production, which have not been influenced in supply by the war operations, we shall find that the advance is not so great.

	1862.	1864.
Ashes.....	\$8 00 a 8 50	\$13 00 a 13 50
Dry cod.....	4 37 a 4 75	7 50 a 8 50
Flour.....	6 60 a 6 95	9 45 a 10 50
Corn.....	81 a 83	1 60 a 1 62
Hay.....	95 a 1 00	1 15 a 1 30
Wheat.....	1 50 a 1 65	2 30 a 2 52
Hops.....	18 a 25	20 a 32
Lime.....	85 a 90	1 00 a 1 10
Pork.....	14 25 a 15 25	35 00 a 39 00
Beef.....	7 00 a 9 00	13 00 a 15 00
Lard.....	9½ a 10½	19½ a 20½
Tallow.....	10½ a 11	19½ a 20½
Whisky.....	40 a 42	1 65 a 1 71
Increase .....	\$44 15½ a 49 71	\$86 27½ a 95 48
Average .....	46 93	90 87

If we compare these thirteen domestic products with the above thirteen imported articles, the respective aggregate advance per cent will appear as follows :

	1862.	1864.	Adv. per cent.
Thirteen imported.....	56.12	172.82	208
Thirteen domestic.....	46.93	90.87	90

The increase of the price of the imported articles is 100 per cent duties, and 18 per cent in the freight and charges, leaving the portion due to the depreciation of paper 90 per cent; the same as in domestic articles. The fact then remains that producers of domestic articles get far less of imported articles for the same quantities sold. To illustrate by single articles. In 1862 one barrel beef



was equal to 100 pounds sugar, at present one barrel of beef will only buy 67 pounds of sugar. In 1862 one ton of iron equaled 18 bushels of wheat, it now equals 32 bushels. We see in these diminished proportions the declining ability of the domestic producers to consume commodities, and therefore the resistless cause of diminishing commerce. The imported articles and the goods manufactured from imported articles are loaded with an immense tax, composed of two elements, the gold which the Government gets and the paper premium on gold, which does not aid the Government in any way. In the case of sugar, every pound consumed pays two taxes, viz., three cents in gold to the Government, and four-and-a-half cents premium on gold or depreciation of paper, and this is paid by the domestic producer, because his articles rise only in proportion to the direct depreciation of the paper in which it is sold. The internal taxes have as yet not been added to the cost of internal production, while the customs tax has swollen the cost in a double ratio. If the depreciation of the currency should progress during the next six months, this difference against the producer must necessarily increase, and with it the disposition to economize. In this sense economy means not only lessened consumption but diminished production, less employment to operatives, and a diminution of the national wealth.

The very high prices thus reached, having greatly reduced the demand for goods for consumption, considerable quantities remained in bond, many in the expectation of being re-exported to more favorable quarters. This general state of business greatly lessened the direct demand for gold and bills for export. While at the same time the sales of United States 5-20's abroad had been so considerable, although at the very unsatisfactory prices of 37½ a 40 cents per dollar, as to supply a considerable amount of bills. This state of affairs, with vague rumours as to approaching peace, impressed the public mind with the idea that gold would fall in value, arrangements were made to realize that idea, and toward's the close of August, on the taking of Atlanta by the federal troops, heavy sales caused a decline from \$2 57 to \$2 14, September 12. This large fall had the greatest influence upon all business, completely paralyzing it. There was no sale for produced bills, and the shipment stopped without bringing any decline in the price of commodities.

The fall in bills, on the other hand, was a great advantage to those who had imported goods in bond, since the decline in gold effected a large reduction in the duties and remittances, and enabled the new goods to come on the market at cost greatly below these in stores. In the expectation of a great reduction there were no buyers. The reduction, however, as a general thing, did not take place. Holders continued to wait for the expected fall business. Another element had a great influence upon the fall trade, viz., the draft for 500,000 men contingent upon the non-supply of volunteers up to the 5th of September. This caused very high prices for volunteers and substitutes, and arrangements for supplying the money, \$500 a \$1,000 was paid per man. Taking the average \$700 the aggregate would be \$350,000,000, raised in a few weeks mostly by that portion of the people not possessed of large means. So large a drain compelled the greatest economy in expenditures, drew down balances in Banks, and bore heavily upon the usual currents of business. The drain took place at a time when, owing to the high prices of crops, much money was wanted to move them, and when the

pay of the soldiers, being long in arrears, had left their families in great distress to meet store bills and current expenses, and when contractors and Government creditors long without pay were needy borrowers and clamorous in their demands. At such a moment the Secretary put forward another loan, the \$31,000,000 balance which had been rejected by Mr. CHASE in June, and an account of which was given in our July number, page 42. The loan being a 6 per cent gold interest stock, payable in 1881, was put upon the market to the highest bidder.

The bids were opened September 9th, and resulted in the award to bidders at 104.03, being nearly the same parties that took the loan in June. Seventy-two millions dollars were offered, and \$41,000,000 were rejected.

The Treasury held about \$12,500,000 of 6 per cent deposits made by the associated Banks, payable at ten days notice. This notice was given by the Banks, and, if the money had been drawn out, would take away nearly all the money obtained by the Treasury on the loan. This induced the Treasury to stipulate that if the Banks would allow the money to remain it should be payable on demand, instead of ten days notice. This the Banks agreed to, and money was more easy.

The amount of loans obtained by the Treasury, August 30 to Sept. 16, was—

On 7-30 paper interest notes.....	\$3,186,410
On 10-40 gold 5 per cent interest stock.....	1,974,300
On 6's of 1881, new loan.....	31,000,000

Total..... \$36,160,410

This was about half of the current expense, but as the \$31,000,000 was paid for in 5 per cent notes to be cancelled, it gave no money. The weekly account of the public debt was suspended August 30; at that date it stood as follows:

	Aug. 16.	Aug. 23.	Aug. 30.
Six per cents, 1867-8.....	\$18,323,592	\$18,323,592	\$18,323,592
Five per cents, 1871-4.....	27,022,000	27,022,000	27,022,000
Five per cents, 1865.....	2,052,000	2,052,000	2,052,000
Six per cents, 1881.....	172,353,500	176,488,650	180,072,500
7-30's, convertible into 1881.....	77,965,400	74,629,300	71,599,800
5-20's 6 per cents.....	510,756,900	510,756,900	510,756,900
10-40's, 5 per cents.....	75,868,800	77,170,700	79,056,700
Oregon, 6 per cents.....	1,016,000	1,016,000	1,016,000
Total gold-bearing.....	\$885,358,192	\$887,459,141	\$889,899,492
Deposits at 6 per cent.....	\$52,821,689	\$59,221,432	\$54,400,352
Treasury certificates, 6 per cents...	186,162,000	192,754,000	203,057,000
One year 5 per cents.....	44,520,000	44,529,000	44,520,000
Two year 5 per cents.....	16,480,000	16,480,000	16,489,000
Two year coupons 5 per cents....	79,577,502	79,377,502	78,973,422
Three year 6 per cents, compound..	41,360,000	43,900,000	45,889,680
New 7-30 per cents.....	14,291,950	21,951,000	29,876,550
Total currency interest.....	\$435,013,141	\$452,203,934	\$469,197,004
Greenbacks.....	\$433,160,569	\$433,166,563	\$433,160,569
Fractional Notes.....	24,017,842	24,283,042	24,345,217
Due Creditors.....	\$78,795,000		
Less on hand.....	17,189,519	71,797,641	61,800,517
Old debt, interest ceased.....	367,170	367,170	357,470
Total, free of interest....	\$529,343,222	\$519,244,123	\$519,468,737
Total of all Debt.....	\$1,849,714,555	\$1,859,274,374	\$1,878,565,233

On the 1st September, about \$40,000,000 arrears of pay fell due to the troops, making nearly \$100,000,000 additional to the debt up to September 16, mostly in paper money. The amount was, therefore, in round numbers, \$2,000,000,000.

Sept., 1863—Official statement.....	\$1,222,113,560
Sept., 1864—Semi-official .....	2,000,000,000

Increase in 12 months.....	\$777,886,440
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Or two and one-eighth millions per day, in addition to the customs and internal taxes, which Mr. FESSENDEN, in his appeal to the people, represented at \$1,000,000 per day. The amount of debt now authorized and available for issues is as follows, per official statement :

Oct. to March 3, 1864—10-40 5 per cent gold bonds.....	\$114,101,100
Oct. to June, 1864—5-40 6 per cent gold bonds.....	366,937,000
Oct. to June, 1864—compound notes.....	55,000,000

Total.....	\$536,038,100
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Thus the authority to issue paper is now confined mostly to gold stock. The compound notes are substituted for 5 per cent legal tenders called in. The utmost efforts are now being made to pay the troops some of their arrears. The stagnation in business caused a great decline in the demand for gold for shipment, and the movement was as follows :

## SPECIE AND PRICE OF GOLD.

		1863.		1864.			
		Received.	Exported.	Received.	Exported.	Gold in bank.	Prem. on gold.
Jan.	2	.....	681,448	254,289	590,262	25,161,935	51½ a 52
	9	1,277,788	726,746	.....	1,216,204	25,122,002	51½ a 52
	16	.....	1,380,247	279,801	1,985,057	24,884,264	52½ a 56½
	23	678,841	780,817	365,608	1,000,000	24,631,204	56 a 58
	30	.....	1,331,027	324,864	668,747	24,203,632	56½ a ...
Feb.	6	301,860	1,277,000	.....	662,616	24,070,191	49½ a ...
	13	359,987	1,152,846	363,198	1,219,803	23,521,453	95 a ...
	20	.....	520,017	.....	325,632	22,523,918	59 a ...
	27	285,894	1,377,016	407,057	531,700	22,301,687	165 a 61
March	5	1,243,551	733,643	512,358	629,803	21,220,653	61½ a 62
	12	.....	3,540,550	.....	465,920	20,750,495	62 a 69
	19	249,514	1,201,907	281,304	83,881	21,059,512	62 a 62½
	26	159,103	1,050,156	375,101	273,900	20,425,504	69½ a 70½
Apr.	2	250,778	473,885	273,429	168,912	19,527,665	63½ a 68½
	9	.....	607,059	302,344	345,471	20,924,287	67 a 71
	16	217,602	158,437	269,522	1,002,384	21,687,670	71 a 89
	23	256,604	629,855	.....	3,226,000	24,868,203	72½ a 79
	30	.....	294,998	282,376	1,271,836	24,087,343	77 a 85
May	7	205,057	461,827	232,276	1,174,241	23,082,023	71 a 81
	14	.....	661,996	.....	2,452,668	22,635,155	61½ a 76½
	12	258,570	438,745	383,428	1,884,195	22,091,691	73 a 85
	28	.....	279,994	.....	580,820	21,973,180	87½ a 92½
June	4	318,066	411,483	271,801	1,425,588	22,461,604	87 a 90½
	11	.....	235,364	.....	1,543,600	24,041,704	92 a 99½
	18	.....	522,147	291,208	1,886,663	22,916,291	94 a 98½
	25	137,082	134,432	281,011	1,296,356	22,000,898	99 a 130
July	2	.....	347,807	.....	560,777	21,206,685	115 a 180
	9	254,947	401,936	301,207	486,339	20,084,917	122 a 176½
	16	.....	2,190,781	.....	301,244	21,234,354	144 a 185



23 ....	.....	1,725,748	249,095	556,464	21,032,912	150½ a 168½
30 ...	270,182	480,374	284,301	404,312	21,051,896	144 a 159
Aug. 6 ....	.....	550,044	.....	90,111	21,159,518	155 a 161½
13 ....	313,612	1,210,220	.....	341,883	21,080,309	152 a 159½
20 ....	.....	238,398	571,281	48,009	20,794,268	155 a 158
27 ....	231,854	1,379,710	.....	206,398	19,952,949	145 a 157
Sept. 3 . .	.....	309,799	387,281	444,503	20,136,547	131 a 153
10 ....	279,043	852,752	.....	486,451	20,603,881	125 a 143
17 ....	193,548	535,796	369,592	669,733	20,065,180	114 a 130

Total.....\$8,541,942 \$29,024,453 9,103,486 32,986,738

The supply of gold in California has been reduced at estimated over three, and by the drought, and the crop of wheat which has been exported, to the extent of four millions has been cut off, thus diminishing the means of remittance here.

The supply of specie in the market was a good deal aided by the operations of the Treasury in paying in advance the interest on the public stocks due November 1. The idea of peace that got abroad, just previous to the surrender of Atlanta, also caused numbers of persons to sell, and others to borrow and sell, for speculative purposes. This decline caused the withdrawal of many goods from bond, and improved the demand for gold, as well for customs as for remittance. Neither the demand nor the supply of bills was large, and there was a great indisposition to operate any farther than the necessities of the moment warranted. The gold price for sterling bills remained very nearly 109 a 109½, and the currency price followed the rate of gold. These rates have been as follows:

#### RATES OF EXCHANGE.

	London.	Paris.	Amsterdam.	Frankfort.	Hamburg.	Berlin.
Jan. 2.,	166 a 166½	3.38½ a 3.34½	62½ a 63	62½ a 63½	55½ a 56	110½ a 111
" 9.,	166½ a 167½	3.38½ a 3.40	62½ a 63	62½ a 63½	55½ a 56½	110½ a 111
" 16.,	169½ a 170½	3.30 a 3.32½	64 a 64½	64½ a 64½	56½ a 57½	112½ a 113½
" 23.,	170 a 171	3.31 a 3.33	64½ a 64½	64½ a 65	56½ a 57	112½ a 113½
" 30.,	171 a 172	3.32½ a 3.28½	64½ a 64½	64½ a 65	57½ a 57½	113½ a 114
Feb. 6,	174 a 175	3.26½ a 3.23½	65½ a 66½	65½ a 66	58 a 58½	115 a 116
" 13,	173 a 174½	3.27½ a 3.23½	65 a 65½	65½ a 65½	58½ a 58½	115½ a 116
" 20,	172½ a 174	3.27½ a 3.23½	65½ a 65½	65½ a 65½	58½ a 58½	115½ a 116
" 27,	173½ a 174	2.26½ a 3.22	65½ a 65½	65½ a 66	58½ a 58½	115½ a 116½
" 6,	174½ a 175½	3.25 a 3.21½	65½ a 66½	66 a 66½	58½ a 59	116 a 117
" 12,	177 a 178	3.15 a 3.18½	66 a 66½	67 a 67½	59 a 59½	117½ a 118
" 19,	176 a 177	3.22½ a 3.18½	65½ a 66½	66 a 66½	58½ a 59	116 a 117
" 26,	179½ a 182	3.15 a 3.10	67½ a 68½	68 a 68½	60½ a 61	120 a 121
April 2,	177½ a 181	3.18½ a 3.12½	66½ a 67	67 a 67½	59½ a 60½	118 a 120
" 9,	184 a 185	3.08 a 3.06½	68½ a 69	68½ a 69½	61½ a 62	121½ a 122
" 16,	189 a 191	2.97½ a 2.95	70 a 71	70½ a 71½	62½ a 64½	127 a 128
" 23,	190 a 192	3.05½ a 2.95	71½ a 71½	71½ a 72	62½ a 63½	124 a 125
" 30,	195 a 198	2.90 a 2.85	73 a 74	73½ a 74½	65 a 66	130 a 131
May 7,	192 a 195	2.96½ a 2.90	72 a 73	72½ a 73½	63½ a 64½	126 a 127
" 14,	192 a 187	2.95 a 3.02	71½ a 70½	71½ a 71	62½ a 63	124 a 125
" 21,	196 a 198	2.87½ a 2.83½	74 a 75½	73½ a 75	65 a 66	130 a 131
" 28,	201 a 203½	2.81½ a 2.77½	75½ a 76½	75½ a 76½	67 a 67½	134 a 135
June 4,	218 a 210	2.72½ a 2.68½	78 a 79	77½ a 74½	68½ a 69	135 a 136
" 11,	215 a 218	2.65 a 2.60	79 a 79½	78 a 79	71½ a 72	143 a 144
" 18,	216 a 219	2.64 a 2.88	79½ a 80½	80 a 80½	72 a 73	145 a 145
" 25,	235 a 238	2.37½ a 2.41½	86 a 87	.. a ..	76 a 77	154 a 155



July 2,	270	a 295	2.15	a 1.92½	93	a 94	.. a ..	85	a 95	185	a 195	
" 9,	292	a 298	1.95	a 1.87½	..	a ..	200	a 215	96	a 98	184	a 188
" 16,	288	a 290	Nominal.									
" 23,	273	a 282	2.10	a 2.01½	..	a ..	101	a 103	90	a 93	182	a 184
" 30,	270	a 274½	2.15	a 2.07½	..	a ..	98	a 100	88½	a 90½	178	a 180
Aug. 6,	279	a 283	2.00½	a 2.00	..	a ..	103	a 105	91	a 93	184	a 185
" 13,	274	a 277	2.05	a 2.07½	..	a ..	..	a ..	91½	a 92½	183	a 185½
" 20,	278	a 279½	2.06½	a 2.02½	100	a 102½	101	a 103	91½	a 92½	183	a 184
" 27,	275	a 276	2.08½	a 2.05	..	a ..	..	a ..	90	a 90½	178	a 180
Sept. 3,	260	a 275	2.15	a 2.05	..	a ..	..	a ..	85	a 90½	170	a 180
" 10,	253	a 256	2.25	a 2.20	93	a 94	..	a ..	83	a 84	166	a 167
" 17,	245	a 248½	2.31½	a 2.27½	..	a ..	..	a ..	80½	a 81½	..	a ..

The amount of bills on the Continent is nominal, and in the month it was stated that some forged Mexican bills, on the French Government, were in the market. The bills drawn against United States 5-20 bonds, sold in Germany, underwent a great diminution, for the reason that the markets there became glutted with bonds, and a sort of panic set in which caused the rate to fall to 35½ cts. per dollar, a decline of 20 per cent from the price of May 24. When the rapid rise in gold caused the bonds to be forwarded to an extent which caused reaction, at the same time the Confederate bonds rose to 80 in London, the semi-annual drawing on these bonds took place, and was paid in specie, making about one-sixth of the loan of \$15,000,000 that has been paid off from the proceeds of cotton, a large portion of which found its way from Texas, where it appears that the growing cotton crop will be as large this year as ever it was, owing to the amount of negro labor that has been transferred thither from Louisiana, Mississippi, and Alabama, the region of the war movements. Picking is now in progress, and the probable yield is represented to be more than 450,000 bales. What this is to the South now may be partially judged when it is known that all of the other Southern States combined will not make an equal amount this year. Texas has suffered, and still suffers, from the war, but her losses are nothing compared to those of other Southern States; or as measured by her own abilities. From the frontier of Texas large quantities of Cotton are finding their way into Mexico, and thence to Europe.

The sales of United States Stocks caused by the low prices abroad, and the fall of exchange here, did not materially affect New York prices, which were as follows:

## PRICES UNITED STATES PAPER.

	6's, 1881.		5's, 1874.	73-10, 8 years.	1 year certif.		Gold.
	Reg.	Coup.			Old.	New.	
January 2..	104½	105½	96	106½	101½	97½	151½ a 151½
" 9..	104½	105½	96	166½	102	97½	152 a 152½
" 16..	104	105½	96	106½	102½	97½	155 a 155½
" 23..	106	107	97	107	103	97	156 a 158
" 30..	106½	106	100	107½	102½	97½	156½ a 156½
February 6..	107½	107½	100	108	102½	98½	159½ a 159½
" 13..	109½	109½	100	109½	103	98½	159½ a 159½
" 20..	111½	110	100	111	103	99½	159½ a 161
" 27..	111½	110½	100	111	103	99½	159½ a 161
March 5..	111½	111	100	111	103½	99½	161½ a 161½
" 12..	112	112	100	110½	103	99½	162½ a 162½
" 19..	112	112½	100	110½	103	99½	162 a 162½
" 26..	112	112½	100	111½	103	99½	169½ a 179

April	2..	111	110	100	111	...	99½	106½ a 167½
"	9..	112	112	102	111½	...	99½	169½ a 170
"	16..	107½	112½	102	112	...	99	173 a 189
"	23..	106½	108	109	109	...	97	174½ a 179
"	30..	114	114	102	111	...	98½	179½ a 179½
May	7..	113	113	102	109½	...	98½	173½ a 173½
"	14..	114	114½	102	111	...	98½	172½ a 172½
"	21..	114	114	102	111	...	98½	183 a 183½
"	28..	114	114	102	111	...	98½	186 a 186½
June	4..	109	113½	102	109½	...	98	190½ a 191
"	11..	108	113	102	108½	...	97½	198½ a 198½
"	18..	107	112	102	107	...	97	195½ a 196
"	25..	104½	112	102	106½	...	96½	212 a 216
July	2..	104½	111	102	105½	...	94	235 a 240
"	9..	104	104	102	105	...	94	266½ a 267
"	16..	102½	102½	102	103½	...	94½	244 a 285
"	23..	102½	102½	102	103½	...	92½	250 a 268
"	30..	107	107	93	107½	...	95½	251 a 251½
Aug.	6..	106½	105½	99	107½	...	94½	260 a 260½
"	13..	106½	107	100	108	...	95	256½ a 256
"	20..	106½	108½	100	110	...	94½	257½ a 257½
"	27..	109½	109½	100	111½	...	95	254 a 255
Sept.	3..	107	107	100	111	...	93½	254 a 254½
"	10..	107	108½	100	111	...	93½	234 a 233
"	17..	108	108½	100	110½	...	93½	222½ a 222½

These prices carry the interest on and for the 6's of 1881, on which there is three months interest, the net price is 104½, which is equal to 45 cts. per dollar gold piece. The price of registered 5-20's here is in gold, less accrued interest, 44, and the last London quotation was 39, giving a slightly higher rate in New York than in London. The large sales that have been made of United States gold interest stock, at less than 40 cts. per dollar, is a matter of great anxiety, since it will be a matter of great future hardship for the country to return \$5 for \$1 received.

## JOURNAL OF BANKING, CURRENCY, AND FINANCE.

NATIONAL BANKS, THEIR NUMBER AND CIRCULATION—GOVERNMENT ISSUES OF COMPOUND NOTES—THE OLD BANKS, THEIR CIRCULATION AND LOAN TO GOVERNMENT—BANK RETURNS OF NEW YORK, PHILADELPHIA, AND BOSTON—NEW YORK BANK DIVIDENDS—FINANCES OF GREAT BRITAIN—THE COTTON TRADE—RETURNS OF BANK OF ENGLAND AND BANK OF FRANCE.

The general banking movement has not been very important in the last month. The leading feature, however, is the great increase in National Bank circulation which has taken place, and which threatens to go on until the whole amount, \$300,000,000, authorized by law is added to the present redundant mass of paper. The following table shows the amount of capital in each State at the close of August and the close of June:

	June 30.	August 31.
Maine .....	\$1,862,975 00	\$2,100,000
New Hampshire.....	500,000 00	680,000
Vermont.....	1,199,141 22	1,310,000
Massachusetts.....	13,775,635 00	15,551,000
Connecticut.....	3,977,555 00	4,825,000
Rhode Island.....	500,000 00	500,000
New York.....	19,066,808 74	20,133,800
Pennsylvania.....	9,203,417 34	10,215,900
New Jersey.....	1,513,870 00	2,220,000
Maryland.....	1,560,000 00	1,550,000
Virginia.....	95,025 00	100,000
Louisiana.....	500,000 00	500,000
Ohio.....	9,180,505 02	10,042,400
Indiana.....	3,422,664 97	3,443,000
Michigan.....	1,114,243 36	1,362,500
Illinois.....	2,828,365 00	4,007,900
Kentucky.....	206,000 00	200,000
Missouri.....	1,605,370 00	1,709,000
Nebraska Territory.....	39,037 00	50,000
West Virginia.....	155,510 00	204,000
District of Columbia.....	500,000 00	500,000
Delaware.....	100,000 00	360,000
Wisconsin.....	858,160 00	997,000
Minnesota.....	250,000 00	300,000
Iowa.....	832,900 00	1,245,000
Kansas.....	82,000 00	100,000
Tennessee.....	250,000 00	350,000
Total.....	\$75,213,945 35	\$81,485,500
Bonds deposited—		
6 per cent registered.....	18,168,750 00	28,561,000
5 do do.....	5,548,100 00	7,637,000
6 per cent coupon.....	18,012,100 00	17,963,100
5 do do.....	2,537,900 00	2,610,900
Total.....	\$44,266,850 00	\$46,524,100
Circulation.....	31,285,270 00	44,225,210

The amount of capital subscribed during the month of August was \$2,608,600, and the amount of circulation issued was \$7,897,950. Under the pressure for money, and the demand for small notes to send to the army, the issue of National Bank notes was very active, and the prospect is that, by January 1, the amount outstanding will reach \$75,000,000. In the first week of September, the whole number of National Banks reached five hundred and eight, with a total capital of eighty-three millions three hundred and sixty-four thousand dollars.

The issue of currency to the National Banks, for the two weeks ending Saturday, September 17, were \$4,623,250. The total that date amounted to fifty millions four hundred and seventy-seven thousand seven hundred and fifty dollars.

This process of issuing notes merely adds to the redundancy of paper and the rise in prices, causing the National expenses to increase in the direct ratio of the advance. It is quite possible that the extra expense thus caused to the Government per annum is equal annually to the whole issues of these institutions. In addition to which they draw, for the present issues, \$2,700,000 in gold interest from the Treasury. The accumulation of these notes is accompanied by a curtailment of one class of Treasury notes by substituting another. Thus there

have been issued by the department \$214,000,000 of interest bearing Treasury notes, which are for their face a legal tender for all debts except duties. These are being rapidly supplanted with Treasury notes, called compound, that are a legal tender for all debts except duties and the *redemption of bank notes*. Of these about \$80,000,000 have been substituted. Soon all the interest bearing notes will be of that description. There will then remain only greenbacks which will be the medium of redemption for the bank notes, now being so rapidly pushed out. The time is near, therefore, when the redundancy of these notes will cause them to be rushed in for redemption, and, by putting the new Banks on the defensive, will compel them to keep more greenbacks on hand, since under the new law there is less room to evade redemption than before. The struggle between the National Banks for greenbacks has already been severe.

The old Banks, as a general thing, are reducing their outstanding circulation. Those of the City of New York have reduced the amount to \$4,169,513, which is one-third the amount outstanding last January. The New York institutions were much pressed for money to meet the instalments due on the loan contracted during the month by the Treasury, although the Secretary agreed to take 5 per cent legal tenders, and allow the interest. The banks held a quantity of 6 per cent deposit certificates, which they were compelled to call in. Accordingly, the Associated Banks voted to do away with the Clearing-House certificates, issued by Mr. Cisco, and make their clearings in legal tender. By this arrangement the \$12,500,000 on temporary deposit at the Sub-Treasury would have been withdrawn, and the Government would have lost the use of this money at a moment when they were much in want of it. The new Assistant-Treasurer, Mr. STEWART, made a proposition to the Banks to issue 5 per cent certificates, instead of 6 per cent as heretofore, and make them payable in legal tenders on demand, instead of, as before, at ten days. The Associated Banks accepted this proposition, with only one dissenting voice, and rescinded their resolution making exchange in legal tenders. The ten days' notice for the \$12,500,000 was therefore withdrawn. This had the effect, to some extent, to restore confidence and diminish the stringency in money.

The returns of the New York Banks show the following features :

## NEW YORK BANKS.

NEW YORK BANKS. (*Capital, Jan., 1864, \$—; Jan., 1863, \$69,494,577.*)

Date.		Loans.	Specie.	Circulation.	Net Deposits.	Clearings.
January	2...	\$174,714,465	\$25,161,935	\$6,103,331	\$140,250,856	\$300,753,147
"	9...	173,009,701	25,122,002	6,032,546	134,861,977	387,546,217
"	16...	165,991,170	23,884,264	6,008,182	130,311,046	416,962,806
"	23...	162,925,880	24,077,513	5,049,807	130,136,203	460,811,543
"	30...	162,296,896	24,203,632	5,913,558	130,665,415	427,306,608
February	6...	163,076,846	24,070,791	5,974,762	133,849,042	425,430,985
"	13...	165,090,329	23,521,453	5,916,707	140,464,616	467,751,745
"	20...	168,302,935	22,523,918	5,908,394	148,014,106	514,887,411
"	27...	174,928,205	22,301,687	5,907,851	154,875,059	575,442,304
March	5...	182,317,378	21,188,034	5,937,167	158,999,668	518,951,433
"	12...	189,757,746	20,750,405	5,918,807	168,044,977	688,322,273
"	19...	198,229,513	21,059,542	5,889,197	169,637,975	618,338,858
"	26...	199,372,437	20,425,504	5,514,139	168,315,904	576,253,989
April	2...	203,993,131	19,526,665	5,708,908	171,151,297	676,372,745
"	9...	204,333,192	20,924,287	5,804,511	170,513,020	658,352,112
"	16...	198,793,699	21,687,670	5,779,650	168,350,790	646,593,643



"	23...	196,286,722	24,868,003	5,679,947	161,978,166	672,442,840
"	30...	194,157,495	24,087,343	5,626,978	164,578,919	446,587,420
May	7...	192,881,246	23,082,028	5,594,832	168,562,197	410,052,013
"	14...	194,178,921	22,635,155	5,482,357	174,426,682	413,552,127
"	21...	197,856,939	22,091,691	5,367,355	173,111,884	486,884,114
"	28...	195,813,462	21,973,180	5,240,812	171,765,696	410,972,198
June	4...	196,740,609	22,461,604	5,180,639	174,516,367	477,648,207
"	11...	194,935,822	24,041,704	5,049,457	172,537,248	445,519,165
"	18...	195,773,583	22,916,291	4,959,096	169,445,767	431,158,427
"	25...	197,077,002	22,000,988	4,807,195	158,772,982	442,840,362
July	2...	198,089,016	21,206,685	4,752,917	154,989,844	452,583,581
"	9...	199,699,742	20,084,917	4,696,107	153,525,977	386,521,426
"	16...	199,043,887	21,284,354	4,724,588	151,816,947	466,125,408
"	23...	190,885,761	21,033,912	4,688,892	147,981,325	403,144,195
"	30...	185,838,480	21,051,896	4,553,426	152,929,633	399,439,739
August	6...	185,563,507	21,159,518	4,522,728	153,279,263	415,360,181
"	13...	185,074,244	21,080,309	4,417,804	155,826,514	422,879,928
"	20...	185,998,407	20,794,268	4,346,653	156,536,217	382,685,847
"	27...	188,502,729	19,952,949	4,256,847	156,036,807	406,296,866
September	3...	189,414,631	20,136,547	4,200,950	151,068,566	436,381,918
"	10...	187,285,127	20,603,881	4,181,616	147,967,942	435,795,830
"	17...	186,317,519	20,185,315	4,169,513	146,378,542	498,191,745

The New York Bank dividends, for January and July, were as follows :

Names of Banks.	Capital.	1862.	1863.	1864.	
				Jan.	July
Atlantic.....	\$300,000	0	0	4	4
Bank of America.....	3,000,000	7	8	5	5
Bank of Commerce.....	10,000,000	6	7½	4	4
Bank of New York.....	3,000,000	6	7½	5	5
Bank of North America.....	1,000,000	6½	7½	4	4
Bank of Commonwealth.....	750,000	6	7	4	5
Broadway.....	1,000,000	10	11	*10	*10
Butchers and Drovers'.....	800,000	10	10	5	5
Chatham.....	450,000	0	7	4	5
Chemical.....	800,000	24	24	†6	†6
Continental.....	2,000,000	6	6½	8½	4
East River.....	206,525	7	7	3½	4
Grocers'.....	300,000	7	8	5	5
Hanover.....	1,000,000	3	7½	4	5
Importers and Traders'.....	1,500,000	6½	7½	5	4
Irving.....	500,000	0	0	3½	4
Manufacturers and Merchants'.....	500,000	6	6½	4	4
Market.....	1,000,000	6	7	4	4
Mechanics'.....	2,000,000	7	7½	4	5
Mercantile... ..	1,000,000	8	9	5	5
Merchants' Exchange.....	1,235,000	6	7½	3½	4
Metropolitan.....	4,000,000	6	11	4	5
Yew York County.....	200,000	6	8½	5	5
New York Exchange.....	150,000	7	8	6	§0
North River.....	400,000	3½	7	3½	5
New York Dry Dock.....	200,000	7	7	3½	3½
Park.....	2,000,000	8	9	†15	5
People's.....	412,500	7	7	4	4
Phoenix.....	1,800,000	6	7	4	4
Seventh Ward.....	500,000	10	10	5	5
Tradesmen's.....	1,000,000	6½	7	5	6
Bull's Head.....	200,000	0	0	†3	†3
Capital.....	\$42,704,025				

\* Including 4 per cent extra. † Quarterly dividend. ‡ Including 10 per cent extra. § Re-organized under National Bank act.

## PHILADELPHIA BANKS.

PHILADELPHIA BANKS. (Capital, Jan., 1863, \$11,740,080; 1862, \$11,970,130.)

Date.	Loans.	Specie.	Circulation.	Deposits.	Due to banks.	Due from banks.
Jan. 4,...	\$35,698,808	\$4,153,585	\$2,055,811	\$29,878,920	\$4,816,763	\$2,963,563
" 11,...	35,458,967	4,158,235	2,050,891	30,484,227	4,001,473	2,814,188
" 18,...	34,896,842	4,158,125	2,044,427	31,194,851	4,330,120	3,063,148
" 25,...	34,349,959	4,103,065	2,047,846	32,354,253	3,500,693	2,905,921
Feb. 1,...	34,345,126	4,108,109	2,056,532	32,027,147	3,453,431	3,271,306
Feb. 8,...	34,146,677	4,102,671	2,066,069	31,033,030	4,080,059	2,461,873
" 15,...	34,590,880	4,102,748	2,069,061	29,911,704	4,322,609	2,080,750
" 22,...	35,059,676	4,102,588	2,119,488	30,783,741	4,463,751	2,099,778
" 29,...	35,519,704	4,102,848	2,167,848	31,435,753	4,887,264	2,114,227
Mar. 7,...	35,913,334	4,102,632	2,208,492	31,712,547	5,323,316	2,116,042
Mar. 14,...	35,956,878	4,099,707	2,308,250	32,511,405	5,508,146	2,333,819
" 21,...	36,412,923	4,099,664	2,340,132	32,835,038	6,933,974	2,428,227
" 29,...	36,695,415	4,096,401	2,357,768	33,156,496	5,791,191	2,724,935
April 4,...	37,262,220	4,095,495	2,390,092	34,404,607	5,641,638	3,425,805
" 11,...	37,032,110	4,093,461	2,379,827	35,958,444	5,855,277	3,799,151
" 18,...	39,535,334	4,095,387	2,329,590	38,174,046	5,748,257	3,291,176
" 25,...	39,570,567	4,095,475	2,253,386	37,393,247	6,067,966	2,592,465
May 2,...	39,770,436	3,972,349	2,241,885	37,758,886	6,374,531	2,730,540
" 9,...	39,639,436	3,967,263	2,152,827	37,466,311	6,636,576	2,786,080
" 16,...	39,262,695	3,964,522	2,131,919	37,638,814	6,580,548	2,853,894
" 23,...	39,639,436	3,967,263	2,152,827	37,466,311	6,636,576	2,786,080
" 30,...	39,262,695	3,964,522	2,131,919	37,638,814	6,580,548	2,853,894
June 7,...	39,723,493	3,994,320	2,100,927	38,249,800	5,993,116	3,186,259
" 14,...	40,266,433	3,964,753	2,077,753	38,367,171	5,930,707	3,007,233
" 21,...	40,266,488	3,964,529	2,074,273	37,588,203	6,403,664	2,998,548
" 27,...	42,057,758	3,963,640	2,092,470	39,122,865	6,544,663	3,139,132
July 4,...	40,918,009	3,955,836	2,154,253	37,945,305	6,225,952	4,323,450
" 11,...	40,717,527	3,949,105	2,337,651	37,312,423	6,197,570	4,658,667
" 18,...	40,731,324	3,948,440	2,208,063	36,462,271	6,189,843	3,616,992
" 26,...	42,057,758	3,963,640	2,092,470	39,122,865	6,544,663	3,139,132
Aug. 2,...	39,277,980	3,962,385	2,249,226	36,520,768	6,059,048	3,816,165
" 9,...	39,142,449	3,962,367	2,231,394	37,234,436	5,992,712	3,785,891
" 16,...	39,353,341	3,962,313	2,214,929	36,826,674	5,801,231	3,691,201
" 24,...	39,401,423	3,962,154	2,222,401	35,869,084	5,738,141	3,891,137
" 31,...	39,778,594	3,972,413	2,361,745	35,603,148	6,070,333	3,704,273
Sept. 7,...	40,334,268	3,962,395	2,454,060	34,931,231	6,119,371	3,419,624
" 14,...	40,885,872	3,962,353	2,524,005	35,039,636	6,071,748	3,047,313
" 21,...	42,404,383	3,961,342	2,574,571	35,913,425	6,031,204	3,031,281
" 27,...	41,539,955	3,960,464	2,610,309	34,838,109	6,121,101	3,057,331

## BOSTON BANKS.

BOSTON BANKS. (Capital, Jan., 1863, \$38,231,700; Jan., 1862, \$38,231,700.)

Date.	Loans.	Specie.	Circulation.	Deposits.	Due to banks.	Due from banks.
Jan. 4,...	\$76,805,343	\$7,503,889	\$9,625,043	\$32,525,679	\$12,831,000	\$12,351,500
" 11,...	77,747,734	7,531,195	10,185,615	31,524,185	12,703,600	11,019,000
" 18,...	75,877,427	7,464,511	9,963,889	31,151,240	12,041,000	11,769,000
" 25,...	74,146,000	7,440,000	9,729,000	30,893,000	11,106,700	12,227,000
Feb. 1,...	73,959,175	7,385,413	9,660,163	30,655,782	10,825,000	11,854,500
" 8,...	71,765,122	7,265,104	9,579,020	30,030,292	11,315,000	12,272,000
" 15,...	71,088,849	7,224,924	9,741,471	30,412,647	11,615,000	13,448,000
" 22,...	71,074,000	7,215,500	9,411,000	31,331,000	11,329,600	14,925,404
" 29,...	72,189,003	7,179,310	9,371,440	33,155,888	12,224,603	16,189,720
Mar. 7,...	72,687,363	7,108,519	9,606,318	33,688,017	12,313,829	16,535,992
" 14,...	72,105,111	7,052,181	9,490,311	33,891,204	12,704,181	17,315,231
" 21,...	73,207,121	7,033,721	9,548,211	35,090,181	13,092,531	17,266,741
" 28,...	73,485,514	7,016,086	9,210,096	34,859,508	13,352,706	17,071,731
April 4,...	71,838,506	6,856,708	9,442,082	32,861,609	13,601,005	15,786,092

Date.	Loans.	Specie.	Circulation.	Deposits.	Due to banks.	Due from banks.
" 11...	72,620,348	6,932,192	10,447,916	33,324,978	15,094,860	17,362,371
" 18...	72,328,896	6,869,726	10,331,806	33,510,054	14,447,997	17,054,244
" 26...	72,538,611	6,952,498	10,938,991	31,810,971	14,715,981	15,790,498
May 2...	71,270,181	6,642,798	10,127,097	31,461,499	14,206,581	14,206,592
" 9...	69,471,481	6,716,484	10,521,591	31,172,584	12,801,000	16,239,000
" 16...	68,888,581	6,644,493	10,126,473	31,633,071	12,500,671	16,201,083
" 23...	66,688,510	6,578,181	9,899,193	36,605,131	11,871,719	15,733,691
" 30...	69,201,301	6,541,201	9,681,204	34,391,208	11,101,307	15,925,201
June 7...	67,093,500	6,509,181	9,160,621	32,771,821	10,875,181	16,130,720
" 14...	67,942,400	6,524,207	8,771,181	33,305,220	10,710,089	15,057,131
" 21...	68,880,121	6,507,021	8,983,121	32,740,201	11,681,602	14,790,012
" 28...	69,691,000	6,470,600	9,068,712	30,865,101	12,260,080	12,872,111
July 5...	68,950,111	6,290,521	9,574,009	29,940,102	11,889,312	13,809,002
" 12...	66,452,107	6,301,101	9,936,491	32,260,004	11,306,002	13,434,523
" 19...	66,079,000	6,246,211	9,890,081	30,584,101	10,003,181	13,942,001
" 26...	59,973,511	5,733,010	9,775,481	27,905,491	9,151,111	13,473,621
Aug 2...	59,760,398	5,729,431	9,327,101	27,866,201	8,947,021	13,039,587
" 9...	60,655,181	5,734,101	9,685,671	27,806,030	9,842,621	13,261,654
" 16...	61,175,211	5,665,981	9,538,841	27,773,821	9,855,921	12,798,821
" 23...	61,817,002	5,660,911	9,567,921	27,221,731	10,052,871	12,007,431
" 30...	61,960,481	5,681,871	9,630,000	26,495,100	10,110,000	11,618,931
Sept. 6...	62,211,931	5,744,893	10,100,400	25,884,487	10,535,000	11,626,011
" 13...	61,818,600	5,789,033	10,274,852	25,015,230	10,152,979	11,142,930
" 20...	61,863,582	5,820,671	10,420,810	24,722,891	10,520,000	11,237,080
" 27...	58,352,671	5,637,921	10,280,431	23,582,981	10,958,781	10,197,691

At the date of our last number the returns from the Bank of England were such as to indicate a further rise in the rate of interest, which has continued for an unusually long period of time, and still with an upward tendency. The moving cause seems the cotton trade. The shutting up of the American ports in 1861 through out of employment a very large amount of capital before employed in buying, manufacturing, and selling cotton, while at the same time there was as a consequence of the closing of the trade, a rise in the value of old stocks of cotton goods all over the world. Hence it could not be otherwise than that money should be very cheap, and  $1\frac{1}{2}$  a 2 per cent was the rule in 1862. Gradually that cheap money stimulated new occupations, and later the credit of corporate companies in all parts of the world has drawn largely upon English capital. The rise in the price of cotton has also stimulated its production to a great extent all over the world, and the sale of it in England has so increased as to create an alarming drain upon her resources. The extent to which this has proceeded may be seen in the following table of the value of cotton imported into Great Britain and the exports of cotton goods in six months of each of the last three years:

From.	1862.	1863.	1864.
United States.....	£226,937	£69,593	£1,245,954
Bermudas.....	.....	634,713	2,038,809
Mexico.....	.....	425,343	1,836,733
Brazil.....	617,889	1,149,928	2,362,974
Turkey.....	.....	340,708	1,296,529
Egypt.....	2,144,591	4,336,874	8,952,379
India.....	3,914,012	9,193,049	15,023,536
China.....	.....	793,883	3,570,152
Other countries.....	785,794	867,185	1,531,226
Total.....	£7,689,223	£17,811,281	£37,858,292
Exports cotton goods....	17,882,132	19,094,206	26,384,995



This gives an immense reverse in trade. In 1862 there was a ratio of \$50,000,000 more goods exported than cotton imported. This year in six months \$100,000,000 more has been paid for cotton than has been received for goods. It is not therefore a matter of surprise that exchanges pass pertinently against England in spite of the continued high rate of interest, or that just fears are entertained that any injury to the crops would precipitate a crisis. The Bank returns are as follows :

## THE BANK OF ENGLAND RETURNS.

Date.	Circulation.	Public Deposits.	Private Deposits.	Securities.	Coin and Bullion.	Rate of Discount.
Dec. 2,...	21,685,732	7,234,894	12,924,545	31,980,889	13,048,475	8 per ct
" 9,...	20,801,207	8,629,856	12,981,276	32,622,659	13,008,617	8 "
" 16,...	20,382,764	9,103,788	13,265,068	32,303,049	13,675,474	7 "
" 23,...	20,273,799	10,266,546	12,711,637	32,270,286	14,217,067	7 "
" 30,...	20,686,538	10,341,991	13,021,212	33,488,184	14,362,606	7 "
Jan. 6, '64	21,322,304	10,001,982	13,052,604	33,486,952	14,196,754	7 "
" 13,...	21,396,420	5,264,097	15,411,794	31,726,575	11,708,597	7 "
" 20,...	21,445,793	5,689,074	13,879,877	31,445,860	12,974,109	8 "
" 27,...	20,875,825	6,337,246	13,406,627	31,017,449	13,022,220	8 "
Feb. 3,...	21,162,626	6,748,867	13,372,981	31,436,334	13,303,243	8 "
" 10,...	20,708,113	7,254,682	12,882,226	36,923,317	13,472,271	7 "
" 17,...	20,696,172	7,079,789	13,306,156	31,078,323	13,583,635	7 "
" 24,...	20,207,871	8,153,601	12,426,673	30,504,327	13,819,412	6 "
March 2,...	20,840,374	7,893,633	13,541,278	31,980,446	14,034,222	6 "
" 9,...	20,563,325	8,863,864	12,434,975	31,769,311	13,884,389	6 "
" 16,...	20,333,112	8,570,711	13,105,800	31,929,164	13,946,943	6 "
" 23,...	20,366,705	9,841,323	12,480,154	32,112,543	14,499,201	6 "
" 30,...	20,908,644	10,280,458	12,658,986	33,472,484	14,163,519	6 "
April 6,...	21,528,914	9,818,880	13,348,299	34,223,509	13,616,762	6 "
" 12,...	21,785,597	5,929,922	13,586,029	31,385,305	13,080,300	6 "
" 20,...	21,672,783	5,787,329	13,684,069	31,596,179	12,743,302	7 "
" 27,...	21,484,602	6,217,965	12,620,036	30,961,635	12,567,776	7 "
May 4,...	22,045,792	6,981,132	12,278,903	32,070,427	12,454,244	9 "
" 11,...	21,478,987	7,299,434	12,901,160	32,239,210	12,705,251	9 "
" 18,...	21,313,352	7,568,661	12,962,402	31,855,696	13,267,446	8 "
" 25,...	20,868,047	7,971,003	12,882,042	31,297,181	13,713,943	7 "
June 1,...	21,246,840	8,286,719	12,493,776	31,329,121	14,052,761	7 "
" 8,...	20,766,405	8,748,510	11,966,204	30,711,740	14,043,129	7 "
" 15,...	20,597,557	8,512,311	12,790,361	30,884,192	14,304,205	6 "
" 22,...	20,623,207	9,287,594	13,051,661	31,948,856	14,319,061	6 "
" 29,...	21,153,606	10,213,535	12,890,244	33,297,897	14,197,849	6 "
July 6,...	21,890,063	9,489,130	13,471,415	34,286,592	13,930,809	6 "
" 13,...	22,161,001	4,683,803	15,082,746	31,637,509	13,701,112	6 "
" 20,...	22,302,688	4,462,490	13,403,675	30,471,085	13,171,561	6 "
" 27,...	22,158,547	4,961,046	13,719,621	31,346,657	12,996,685	8 "
Aug. 3,...	22,489,710	5,155,704	13,519,626	31,909,793	12,877,483	8 "
" 10,...	21,881,314	4,968,222	14,419,766	32,202,646	12,609,925	8 "
" 17,...	21,554,139	5,145,800	13,950,446	31,594,936	12,725,759	8 "
" 24,...	21,047,048	5,288,725	13,714,161	30,861,710	12,831,751	8 "
" 31,...	21,289,324	5,815,742	13,073,751	31,058,341	12,980,033	8 "
Sept. 7,...	21,367,124	6,022,373	12,904,085	31,202,405	12,970,447	9 "

The aggregate British trade continues very large, but there is a disposition of capital to leave Britain, which the continued high rate of money restrains, and which rate is seen in the decline in consols, they being lower now than for many years. The large German interest in United States bonds have absorbed a sum which the low rate of consols might otherwise have attracted to London.

In France the rate of money is more steady, and it is remarkable that the



Bank of France is enabled to keep her rate at 6 per cent or 2 per cent under that of England, and with very little variations. The returns of the Bank interest are as follows :

## BANK OF FRANCE.

	Loans.	Specie.	Circulation.	Deposits.	Interest.
January	—fr.751,649,983	fr.169,027,010	fr.813,490,825	fr.159,797,667	7
February	— 705,516,796	182,573,888	775,096,775	160,110,225	7
March	— 642,135,993	195,994,738	746,610,375	142,925,719	6
April	— 643,570,276	219,320,720	759,926,425	133,701,530	6
May	— 683,332,517	242,824,609	767,443,475	178,434,305	8
June	— 577,309,524	294,892,295	725,381,925	156,685,209	6
"	23, 594,563,973	280,511,406	720,243,375	144,559,768	6
"	30, 676,605,538	277,544,816	766,609,875	165,668,712	6
July	7, 662,197,524	276,522,727	772,309,475	170,022,200	6
"	14, 667,187,446	266,890,961	792,819,275	152,242,482	6
"	21, 639,299,542	269,810,253	788,378,725	135,282,170	6
"	28, 642,692,154	276,162,420	791,673,525	144,636,985	6
August	4, 634,904,899	276,790,393	786,629,625	157,810,891	6
"	11, 633,495,575	272,433,487	777,023,925	148,866,812	6
"	18, 627,110,297	276,200,183	789,096,425	139,746,017	6
"	25, 615,885,942	280,595,089	767,100,725	130,431,547	6
September	1, 618,948,683	279,353,778	767,763,725	141,075,120	6
"	8, 618,030,503	281,021,082	752,214,625	137,349,361	7

The imports and exports of silver and gold into and from France have been as follows for six months of 1864 :

		Silver.	Gold.
Imported.....	frances	158,957,788	281,437,874
Exported .....		196,819,685	184,231,842
Excess exports.....		37,861,897	.....
Excess imports.....		.....	97,205,532

Thus the exchange of gold for silver seems to keep up a steady current, with, however, an aggregate increase of coin in France.

## PNEUMATIC RAILWAYS.

The power employed by the Pneumatic Despatch Company of London, in the conveyance of letters and parcels, has from time to time, in years past, been used in an experimental way to propel cars, but never very successfully. We can, however, see no reason why it should fail if properly applied. A series of experiments were made, the latter part of August, at Sydenham, in the Crystal Palace grounds, with, it is said, far more favorable results than ever before. The trial was on the model Pneumatic Railway recently constructed under the superintendence of Mr. RAMMELL, C. E., and was conducted in the presence of several eminent engineers and scientific men. A brickwork tunnel, about 10 feet high by 9 feet wide, and capable of admitting the largest carriages used on the Great Western Railway, was laid with a single line of rails, fitted with opening and closing valves at either extremity, and supplied with all the other re-

quisite apparatus for propelling passenger trains on the pneumatic principle. The tunnel, or tube, is described by the *Ironmonger* of London as extending from the Sydenham entrance of the grounds to the Armoury, near the Penge-gate, a distance of nearly 600 yards. The object of laying down this experimental line was to afford, both to the scientific world and the travelling public, a practical demonstration of the applicability to passenger traffic of the motive power employed, as we have already stated, by the Pneumatic Despatch Company in the conveyance of letters and parcels. The pneumatic principle of propulsion is very simple. It has been likened to the action of a pea-shooter—a rough kind of comparison, perhaps, yet one sufficiently accurate as a popular illustration. The tunnel may be taken to represent the pea-shooter, and the train the pea, which is driven along in one direction by a strong blast of air, and drawn back again in the opposite direction by the exhaustion of the air in front of it. The train may be said, in fact, to be blown through the tube on the down journey, and sucked through it on the return journey. It must not, however, be supposed that the passengers are deposited at their destination with a sudden jerk, as the simile we have used might seem to imply. Such an inconvenience is entirely obviated by the mechanical arrangements employed. The motion is throughout smooth, easy, and agreeable, and the stoppages are effected gently and gradually. Indeed, when it is considered that the curve in the tunnel is unusually sharp, being of eight chains radius, and that the gradients are as high as 1 in 15, it is surprising that the motion should be so much steadier and pleasanter than ordinary railway travelling. The journey of 600 yards was performed either way in about 50 seconds, with an atmospheric pressure of only  $2\frac{1}{2}$  ounces to the square inch; but a higher rate of speed, if desirable, can easily be obtained consistently with safety. Indeed, one great incidental advantage of this species of locomotion is, that it excludes all risk of the collisions occasionally attendant on railway travelling; for it is plain that no two trains could ever run full tilt against each other where all the propelling force is expended in one direction at one time. The worst mishap which it is said could well happen is that, owing to some sudden failure in the machinery, the train might be abruptly brought to a dead stop in the middle of the tunnel, when the passengers would have to alight from the carriages and grope their way as best they could out of the tube. Such a predicament certainly would not be enviable, but it might be more ludicrous than dangerous. Whether in such a contingency there is any possibility of another train being started before they had safely made their exit, or any risk of their sharing the fate of frogs placed under an exhausted air-pump, we do not venture to assert; but probably the scientific engineer could guarantee the traveller against any such novel peril. The train used on the trial consisted of one very long, roomy, and comfortable carriage, resembling an elongated omnibus, and capable of accommodating some 30 or 35 passengers. Passengers enter this carriage at either end, and the entrances are closed with sliding glass doors. Fixed behind the carriage there is a framework of the same form, and nearly the same dimensions, as the sectional area of the tunnel; and attached to the outer edge of this frame is a fringe of bristles forming a thick brush. As the carriage moves along through the tunnel the brush comes into close contact with the arched brickwork, so as to prevent the escape of the air.

With this elastic collar round it, the carriage forms a close-fitting piston, against which the propulsive force is directed. The motive power is supplied in this way:—At the departure station a large fan-wheel, with an iron disc, concave in surface and 22 feet in diameter, is made to revolve by the aid of a small stationary engine at such speed as may be required, the pressure of air increasing, of course, according to the rapidity of the revolutions, and thus generating the force necessary to send the heavy carriage up a steeper incline than is to be found upon any existing railway. The disc gyrates in an iron case resembling that of a huge paddlewheel; and from its broad periphery the particles of air stream off in strong currents. When driving the air into the upper end of the tunnel to propel the down-train, fresh quantities rush to the surface of the disc to supply the partial vacuum thus created; and, on the other hand, when the disc is exhausting the air in the tunnel with the view of drawing back the up-train, the air rushes out like an artificial hurricane from the escape valves of the disc case, making the adjacent trees shake like reeds and almost blowing off his feet any incautious spectator who approaches too near it.

When the down journey is to be performed, the breaks are taken off the wheels, and the carriage moves by its own momentum into the mouth of the tube, passing in its course over a deep air well in the floor, covered with an iron grating. Up this opening a gust of wind is sent by the disc, when a valve, formed by a pair of iron doors, hung like lock-gates, immediately closes firmly over the entrance of the tunnel, confining the increasing atmospheric pressure between the valve and the rear of the carriage. The force being thus brought to bear upon the end of the train, the latter, shut up within the tube, glides smoothly along towards its destination, the revolving disc keeping up the motive power until it reaches the steep incline, whence its own momentum again suffices to carry it the rest of the distance. The return journey, as above indicated, is effected by the aid of the exhausting process. At a given signal a valve is opened, and the disc wheel set to work in withdrawing the air from the tube. Near the upper end of the tube there is a large aperture, or side-vault, which forms the throat through which the air is, so to speak, exhaled, the iron doors at the upper terminus still being kept shut. In a second or two the train posted at the lower terminus, yielding to the exhausting process going on in its front, and urged by the ordinary pressure of the atmosphere from behind, moves off on its upward journey, and rapidly ascending the incline approaches the iron gates, which fly open to receive it, and it emerges at once into daylight. Such is the mode in which the system works, and it seems capable of being adapted to railway communication wherever tunnelled lines with steep gradients exist. The chief obstacles encountered in practically working the atmospheric railway, introduced some fifteen years ago, are considered to have been effectually overcome by the present modification of the principle. Under the former system the tube was of very small size, and fixed upon the ground; a longitudinal or continuous valve opening at the top, along which a rod, connecting the piston with the carriages, passed, and the valve closing behind the rod as it moved onwards. The amount of atmospheric pressure required to be exerted where the area of the tube was so small was enormous, being from 7 pounds to 10 pounds per square inch; whereas upon Mr. RAMMELL'S principle the pressure is only  $2\frac{1}{4}$  ounces per square



inch, and, moreover, the great leakage and waste of power which rendered the old atmosphere system so costly in working are here in great measure avoided. It need hardly be added, that, the worst drawbacks to travelling through tunnels—viz., the smoke and sulphureous vapours emitted from the locomotive, and the close, unwholesome atmosphere of the tunnels themselves—are in this case got rid of. Every train, in fact, carries its own supply of fresh air along with it, and also expels the foul air before it.

### MINERAL STATISTICS OF GREAT BRITAIN AND IRELAND FOR 1863.

#### COAL, IRON, COPPER, TIN, LEAD, ZINC, AND GOLD.

WE obtain from the published reports, for 1863, the following respecting the mineral wealth of the United Kingdom :—

##### COAL.

Of this, the most important mineral product, the enormous quantity of 86,292,215 tons was obtained in 1863, being an increase of more than 4,500,000 tons upon the produce of 1862. The exports of coal in the three last years have varied but little in amount. Thus, in 1861, 7,222,718 tons were exported; 1862, 7,671,670 tons; 1863, 7,529,341 tons. Hence it follows that there must have been greatly increased energy in some branches of British manufacture to account for this large consumption of coal. In 1862 it appears that considerable quantities were stocked, especially in Lancashire and other districts devoted to textile manufactures; this does not seem to have been the case last year, the whole being returned as “sold or used.”

The great extension of coal-mining is shown by the fact that, in 1853, the number of collieries at work amounted to 2,397; whereas, in 1863, the number had risen to 3,180. In the great northern coalfields of Durham and Northumberland, we find the production of its collieries has increased from 19,360,356 tons in 1862, to 22,154,146 tons in 1863. At the same time, there has been a decrease of the quantities shipped to foreign countries and sent coastwise to the extent of 418,163 tons; but the North-Eastern Railway carried out of this coalfield 2,029,803 tons of coal and coke more than it transported in 1862.

In the returns given of coal production, the quantities wasted in “getting” and at the pit’s mouth is not stated. It may be inferred that this is very large when we find the coal-trade of the north giving in their report the “duff and waste” from their own district as 500,000 tons. Taking this into consideration, it is evident that the rate at which the exhaustion of these coal beds is now progressing cannot be regarded as less than 90,000,000 tons per annum.

##### IRON.

The iron ore produce of the United Kingdom amounted to 9,088,060 tons in 1863. Of this the Cleveland district, in the North Riding of Yorkshire, produced 2,553,805 tons of argillaceous carbonate of iron; Scotland, 1,500,000



tons, principally of black band iron ore; while Lancashire gave 658,643 tons, and Cumberland 690,974 tons, of their remarkable red hæmatite. This iron ore, with about 50,000 tons imported, fed 597 blast furnaces, which yielded the following amounts of pig iron:—England, 2,451,211 tons; Wales, 898,829 tons; Scotland, 1,160,000 tons: total, 4,510,040 tons. This was 566,571 tons more pig iron than made in 1862. This will account for the extra consumption of very nearly 2,000,000 tons of coals.

#### COPPER.

The copper mines have, for some few years, exhibited a regular falling off in their rate of production. Two hundred and twenty-two copper mines, of which 190 are in Devonshire and Cornwall, gave 210,947 tons of copper ore, the money value of this being £1,100,554, or about \$5,502,770. By smelting this ore 14,247 tons of fine copper is obtained. In addition to this 26,386 tons of copper ore were imported from foreign and colonial mines, which gave 4,461 tons of metal, sold at public sales; and 70,498 tons of copper ore, producing 17,509 tons of copper, were sold by private contract. Of the foreign ore there was imported from Chili 25,966 tons, and 18,708 tons of regulus, while Cuba sent 15,570 tons of ore and 858 tons of regulus.

#### TIN.

From the tin mines of Cornwall and Devonshire, in the year 1863, a larger quantity of tin was obtained than in all probability was ever before produced; the tin ore raised being 15,157 tons, which gave 10,006 tons of white (metallic) tin. When we remember that these tin mines have been most industriously worked for more than three thousand years, this return will convey some idea of the continued richness of this stanniferous district, and of the enormous value of the original deposit. We have recently been made acquainted with some curious facts connected with the mode of occurrence of tin in the "lode," or mineral vein. All the old tin mines were shallow workings, and many mines were abandoned at comparatively small depths when the miners "came to the yellows," by which they meant copper ore; the "yellows," as the phrase was, "always cutting out the tin." Dolcoath, and many other mines which were worked for tin, passed gradually into copper mines, and were then prosecuted to great depths for that metal. Passing, however, through the copper ore in the lode, the miners have again come into rich deposits of tin. From Dolcoath mine, at a depth of nearly 300 fathoms, the adventurers obtained, last year, 1,026 tons of tin ore, worth £69,741. Many other mines are exhibiting precisely the same conditions, and the belief that the ores of the valuable metal tin occur only near the surface is exploded. England imported, principally through Holland and from British India, *via* Singapore, 2,728 tons of tin and 559 tons of tin ore and regulus.

#### LEAD.

The lead mines of these islands produced 91,283 tons of lead ore, which yielded 68,220 tons of metallic lead, and 634,004 ounces of silver. The lead mines of the United Kingdom are more generally diffused than those of any other metal except iron—the counties producing the largest quantities being,—

	Lead Ore. Tons.	Lead. Tons.	Silver. Ounces.
Durham and Northumberland.....	22,774	17,205	81,315
Yorkshire.....	8,931	6,171	3,270
Denbighshire.....	7,919	6,432	29,797
Cardiganshire.....	7,131	5,661	58,846
Cumberland.....	6,690	4,949	41,304
Cornwall.....	6,259	4,270	206,312

There appears to be a regular order in the increase of the quantities of silver contained in the ores of lead as we advance towards the southern and western counties.

## ZINC.

Of zinc ores—*black-jack* of the miners, *blende* of the mineralogists—the mines produced 13,699 tons, which on smelting, gave of metallic zinc 3,835 tons. The zinc miners have, however, much difficulty in competing with the mines producing the ores of zinc on the Continent.

## GOLD.

In the appendix to the mineral statistics we have a complete list of all the mines and collieries of the United Kingdom, with the names of the companies or proprietors working them. From this list we learn that there are 23 mines dignified with the names of gold mines in North Wales. We have, however, returns of gold from only two of these, and the total quantity obtained is only 552 ounces, of the value of £1,747. In 1862 Vigna and Clogan alone produced 5,299 ounces of gold of the value of £20,390. These results, after all the excitement about British gold mines which has been rife during the past four years, leading to the expenditure of very large sums of money upon the hills of Merionethshire, should read a lesson to eager adventurers.

The following tables place the whole question of the value of the mining operations of the United Kingdom at once before the eye:—

## VALUE OF THE PRODUCTS OF THE MINES IN THE UNITED KINGDOM FOR 1863.

Minerals.	Quantity.	Value.
Gold quartz, tons.....	385	£1,500
Tin ore, tons.....	15,157	963,985
Copper ore, tons.....	210,947	1,100,554
Lead ore, tons.....	91,283	1,193,530
Silver ore, tons.....	88	5,703
Zinc ore, tons.....	12,941	29,968
Iron ore, tons.....	9,101,552	3,240,890
Pyrites, tons.....	95,376	62,035
Wolfram, tons.....	13	67
Uranium, cwts.....	3	23
Gossans, tons.....	4,424	4,576
Arsenic, tons.....	1,444	1,200
Coals (sold and used), tons.....	86,292,215	20,572,945
Earthy minerals, estimated at.....	—	1,975,000

Total value of the minerals produced in 1863..... £29,151,976

Or, about \$145,759,880.

## METALS PRODUCED FROM BRITISH MINERALS AND COALS.

	Quantity.	Value.
Gold, ounces.....	552	£1,747
Tin, tons.....	10,006	1,170,702
Copper, tons.....	14,247	1,409,608
Lead, tons.....	68,220	1,418,985
Silver, ounces.....	634,004	174,351
Zinc, tons.....	3,835	90,889
Iron (pig), tons.....	4,510,040	11,275,100
Total value of the above.....		£15,541,382
Estimated value of other metals.....		250,000
Coals.....		20,572,945
Total value of the metals obtained, and coals produced in 1863.....		£36,364,327

Or, about \$181,821,635.

## THE NEW ALMADEN QUICKSILVER MINES.

THE following, which we find in the September number of the *American Journal of Science*, was written by Professor SILLIMAN, Jr., who is now in California :

The New Almaden Quicksilver Mines are situated on a range of hills subordinate to the main coast-range, the highest point of which at the place is 1,200 to 1,500 feet above the valley of San Jose. Southwest of the range which contains the quicksilver mines, the coast-range attains a considerable elevation, Mt. Bache, its highest point, being over 3,800 feet in height.

New Almaden is approached by the railroad running from San Francisco to San Jose, a distance of 45 miles. In the course of it there is a rise of 100 feet, San Jose being of this elevation above the ocean. From San Jose to New Almaden the distance is 13 miles, with a gradual rise of 150 or perhaps 200 feet.

The rocks forming the subordinate range in which the quicksilver occurs, are chiefly magnesian schists, sometimes calcareous and rarely argillaceous. As a group they may be distinguished as steatitic, often passing into well characterized serpentine. Their geological age is not very definitely ascertained, but they are believed by the officers of the State Geological Survey to be not older than Cretaceous. But few fragments of fossils, and these very obscure, have yet been found in these metamorphic rocks. At a point just above the *dumps*, behind the reduction works at the hacienda (or village,) there is an exposure, in which may be clearly seen in projecting lines the waving edges of contorted beds of steatite and serpentine, interspersed with ochery or ferruginous layers, more easily decomposed ; and the partial removal of the latter has left the steatitic beds very prominent.

The mine is open at various points upon this subordinate range over a distance of 4 or 5 miles, in a northeast direction. The principal and the earliest workings of the mine were in a right line, but little more than a mile distant from the

hacienda. The workings are approached, however, by a well graded wagon road, skirting the edges of the hills, which is two and three-eighth miles in length.

It appears partly from tradition, and partly from the memory of persons now living, that the existence of cinnabar upon the hill was known for a long time prior to the discovery that it possessed any economic value. In fact, upon the very loftiest summit of this subordinate range, cinnabar came to the surface, and could be obtained by a slight excavation or even by breaking the rocks lying upon the surface. In looking about for physical evidences such as would aid the eyes of an experienced observer in detecting here the probable presence of valuable metallic deposits, one observes on the summit of the hill, at various points along the line of its axis for 2 or 3 miles, and also beyond, toward the place called Bull Run, occasional loose boulders of drusy quartz, with more or less well characterized geodes and combs; accompanying which is an ochraceous or ferruginous deposit, such as frequently forms the outcrop of metallic veins. There is, however, no such thing as a well characterized vein, the quartz and its associated metals occurring rather in isolated masses or bunches segregated out of the general mass of the metamorphic rocks, and connected with each other, if at all, somewhat obscurely by thread veins of the same mineral.

The main entrance to the mine at present is by a level about 800 feet long, and large enough to accommodate a full sized railroad and cars. This level enters the hill about 300 feet from its summit, and is driven into a large chamber, formed by the removal of a great mass of cinnabar, leaving ample space for the hoisting and ventilating apparatus employed in working the mine.

At this point a vertical shaft descends to an additional depth of nearly 300 feet, over which is placed a steam "whim" with friction gearing and wire rope, worked by a steam engine, and by means of which all the ore from the various workings of the mine is conveniently discharged from the cars, which convey it out of the level to the dressing floors.

The first thing which strikes the observer on entering the mine is the liberal scale of its exploration. Every thing indicates a liberal and judicious use of capital in the development of a property which upon any other principle of exploration would probably have been unremunerative. We note also the absence of the usual galleries or levels, cut at regular distances of ten fathoms, common in the exploration; for example, of copper mines, and of other metallic deposits in which the ore is confined to well characterized veins.

In order to reach the lower workings of the mine, the observer may employ the bucket as a means of descent, or he may, in a more satisfactory manner, descend by a series of ladders and steps, not in the shaft, but placed in various large and irregular openings, dipping for the most part in the direction of the magnetic north, and at an angle of 30° to 35°. These cavities have been produced by the miner in extracting the metal, and are often of vast proportions; one of them measures 150 feet in length, 70 feet in breadth, and 40 feet in height—others are of smaller dimensions; and they communicate with each other sometimes by narrow passages, and at others by arched galleries cut through the unproductive serpentine.

Some portions of the mine are heavily timbered to sustain the roof from crush-



ing, while in other places arches or columns are left in the rock for the same purpose.

The principal minerals associated with the cinnabar are quartz and calcareous spar, which usually occur together in sheets or strings, and in a majority of cases penetrate or subdivide the masses of cinnabar. Sometimes narrow threads of these minerals, accompanied by a minute coloration of cinnabar, serve as the only guide to the miner in re-discovering the metal when it has been lost in a former working.

Veins or plates of white massive magnesian rock and sheets of yellow ochre also accompany the metal. Iron pyrites is rarely found, and no mispickel was detected in any portion of the mine; running mercury is also rarely, *almost never*, seen.

The cinnabar occurs chiefly in two forms, a massive and a subcrystalline. The first is fine granular, or pulverulent, soft, and easily reduced to the condition of vermilion; the other is hard, more distinctly crystalline, compact and difficult to break; but in neither of these forms does it show any tendency to develop well formed crystals. It is occasionally seen veining the substance of greenish white or brown compact steatite or serpentine.

The ores are extracted by contract, the miners receiving a price dependent upon the greater or less facility with which the ore can be broken. By far the larger portion of the work people in the mines are Mexicans, who are found to be more adventurous than Cornishmen, and willing oftentimes to undertake jobs which the latter have abandoned. The price paid for the harder ores in the poorer portions of the mine is from \$3 to \$5 per cargo of 300 pounds. This weight is obtained after the ore is brought to the surface and freed by hand breaking from the superfluous or unproductive rock; by this arrangement, the company are secured from paying for anything but productive mineral. All the small stuff and dirt formed by the working of the "labors," are also sent to the surface to form the adobes used in charging the furnaces.

It has often happened in the history of this mine, during the past fifteen years, that the mine for a time has appeared to be completely exhausted of ore. Such a condition of things has, however, always proved to be but temporary, and may always be avoided by well directed and energetic exploration. Upon projecting, by a careful survey, irregular and apparently disconnected chambers of the mine in its former workings in a section, there is easily seen to be a general conformity in the line of direction and mode of occurrence of the productive ore masses. These are found to dip in a direction toward the north, in a plain parallel, for the most part, to the pitch of the hill, but at a somewhat higher angle. An intelligent comprehension of this general mode of structure has always served hitherto in guiding the mining superintendent in the discovery of new deposits of ore.

Since the settlement of the famous law suit, which has so long held this company in a condition of doubt, the new parties, into whose hands the property has now passed, have commenced a series of energetic and well directed explorations at various points upon the hill, with a view to the discovery of additional deposits of ore. At one of these new openings, distant at least 500 feet from the limit of the old workings, and not more than 200 feet from the summit of the

hill, a deposit of the richest description of the softer kind of cinnabar has been discovered, which, so far as hitherto explored, has a linear extent of at least 70 or 80 feet, and in point of richness has never been surpassed by any similar discovery in the past history of the mine. A charge of 101,000 pounds, of which 70,000 were composed of this rich ore, 31,000 pounds of "granza," or ordinary ore, and 48,000 pounds of adobes, worth 4 per cent, making a total charge of 105,800 pounds, yielded on the day of our visit, 460 flasks of mercury at 76½ pounds to the flask. This yield is almost without parallel in the history of the mine. The only preparation which the ores undergo, preparatory to reduction, consists of hand-breaking, or "cobbing," for the removal of the unproductive rock.

The small ores and dirt hoisted from the mine are made into "adobes," or sundried bricks, sufficient clay for the purpose being associated with the ore. The object of these "adobes" is to build up the mouths of the furnaces to sustain the load of richer ores. No flux is employed, there being sufficient lime associated with the ores to aid the decomposition of the sulphurets.

The furnaces are built entirely of brick, in dimensions capable of holding from 60,000 to 110,000 pounds, according to the character of the ores employed. The chambers are fired from a lateral furnace, fed with wood, and separated from the ore by a wall pierced with numerous openings by the omission of bricks for that purpose.

Connected with the furnace is a series of lofty and capacious chambers, also of masonry, through which the whole product of combustion is compelled to pass alternately above and below, from chamber to chamber, until all the available mercury is condensed. The draft from these furnaces is carried by inclined stacks up to the top of a lofty hill several hundred feet distant; and here the sulphurous acid and other effete products of the furnace are discharged. Formerly, no precautions were taken to prevent the escape of mercury through the foundations of the furnace to the earth beneath; now, the furnaces stand upon double arches of brick-work, and plates of iron are built into the foundations, so as to cut off entirely all descending particles of the metal and turn them inward. To be convinced of the importance of this precaution, it is sufficient to watch the operation of the furnace for a few moments, when an intermittent stream may be seen to flow into a reservoir provided for it, and which by the former process was completely lost in the earth.

On taking up the foundations of some of the old furnaces, within the last two years, the metal was found to have penetrated, or rather permeated, completely through the foundation and clay of the substructure down to the bed-rock beneath, a depth of not less than 25 or 30 feet. Over 2,000 flasks of mercury were thus recovered in a single year from the foundations of the two furnaces. This loss is entirely avoided by the improved construction which has been adopted.

The whole process of reduction is extremely simple, the time occupied from one charge to another being usually about seven days. The metal begins to run in from four to six hours after the fires are lighted, and in about sixty hours the process is completed. The metal is conducted through various condensing chambers by means of pipes of iron, to a "crane-neck," which discharges into capa-

cious kettles. It undergoes no further preparation for market, being quite clean from all dross.

Deducting 2½ years, during which the mines were in a state of inactivity, pending the decision of the law-suit, the average monthly product for 12½ years has been not far from 2,500 flasks, of 76½ pounds each, of mercury. The selling price in San Francisco is, at present, and has been for some time past, 75 cents per pound, while in London and New York it has ranged from 40 to 50 cents per pound.

San Francisco, May, 1864.

### BREADSTUFFS.—EXPORTS TO GREAT BRITAIN AND IRELAND AND THE CONTINENT FROM THE UNITED STATES AND CANADA.

THE exports of breadstuffs the past year show a great decrease in quantities and still greater decrease in values over previous years. As to the corn trade it has been almost entirely suspended, the small shipments that were made being at a loss.

The following is an estimate of the total quantities and value of the shipments of flour, wheat, and corn, from the United States to Great Britain, Ireland, and the Continent, from September, 1, 1863, to September 1, 1864, compared with the previous year :

	Flour, bbls.	Wheat, bush.	Corn, bush.	Estimated value in U. S. currency.
1862-63.....	1,692,992	25,510,504	10,403,313	\$58,819,110
1863-64.....	1,352,706	16,822,370	695,226	25,571,976
Decrease.....	340,186	8,688,134	9,708,087	\$33,247,134

Below we give our usual table of the exports of breadstuffs from the United States for the year ending September 1, 1864 :

#### EXPORTS OF BREADSTUFFS FROM UNITED STATES TO GREAT BRITAIN AND IRELAND, FROM SEPTEMBER 1, 1863, TO SEPTEMBER 1, 1864.

From—	Flour, bbls.	Meal, bbls.	Wheat, bush.	Corn, bush.
New York.....	1,020,858	114	15,123,990	664,852
Philadelphia.....	77,338	...	500,866	583
Baltimore.....	24,359	...	60,129	17,256
Boston.....	39,586	...	.....	.....
Other ports.....	95,286	...	807,958	.....
Total.....	1,257,377	114	16,492,943	682,691

The following are the total quantities for the last eighteen years :

	Flour, bbls.	Meal, bbls.	Wheat, bush.	Corn, bush.
1863-64.....	1,257,377	114	16,492,943	682,691
1862-63.....	1,479,413	1,147	23,167,190	10,334,356
1861-62.....	2,672,515	1,124	25,754,709	14,084,168
1860-61.....	2,561,661	4,416	25,553,370	11,705,034
1859-60.....	717,156	944	4,938,714	2,221,857
1858-59.....	106,457	58	439,010	342,013
1857-58.....	1,295,430	143	6,555,643	3,317,802



1856-57.....	849,600	685	7,479,401	4,746,278
1855-56.....	1,641,265	6,816	7,966,406	6,731,161
1854-55.....	175,209	4,768	324,427	6,679,188
1853-54.....	1,846,920	41,726	6,038,003	6,049,371
1852-53.....	1,600,449	100	4,823,519	1,425,278
1851-52.....	1,427,442	1,780	2,728,442	1,487,398
1850-51.....	1,559,584	5,620	1,496,355	2,205,601
1849-50.....	574,757	6,411	461,276	4,753,353
1848-49.....	1,137,556	82,900	1,140,194	12,685,260
1847-48.....	182,583	108,534	241,300	4,390,226
1846-47.....	3,155,845	844,188	4,000,359	17,157,659
Total .....	24,241,219	1,111,374	139,591,261	110,998,649

Below we give the exports for a series of years to the continent from the United States, and also a table showing the quantities exported during same time from Canada :

TO THE CONTINENT.				
From—	Flour, bbls.	Wheat, bush.	Corn, bush.	Rye, bush.
New York .....	80,049	329,427	12,535	13,965
Other ports .....	15,280	.....	.....	.....
Total, 1863-64.....	95,329	329,427	12,535	13,965
" 1862-63.....	206,176	2,265,431	68,957	429,956
" 1861-62.....	619,109	7,577,350	322,074	1,584,501
" 1860-61.....	142,129	3,452,496	101,145	847,258
" 1859-60.....	49,243	178,031	19,358	.....
" 1858-59.....	51,388	57,845	25,519	.....
" 1857-58.....	303,100	390,428	16,848	13,100
" 1856-57.....	488,314	2,875,653	563,590	216,162
" 1855-56.....	748,408	2,610,079	282,083	1,975,178

FROM CANADA TO GREAT BRITAIN AND IRELAND, VIA ST. LAWRENCE.

	Sept. 1, 1863, to Sept. 1, 1864.	Sept. 1, 1862, to Sept. 1, 1863.	Sept. 1, 1861, to Sept. 1, 1862.
Flour .....	378,244	687,986	617,308
Wheat .....	2,506,504	5,722,377	6,376,905
Corn .....	54,040	1,578,458	2,016,040
Peas .....	552,605	694,999	822,060
Oats .....	169	9,024	750,756
Oatmeal .....	.....	1,020	7,242

NEW YORK CITY AND COUNTY RESOURCES, DEBT, SINKING FUND, ETC.

THE necessary means to defray the ordinary expenses of the New York City and County governments are derived from : first, the general fund, which comprises all the ordinary revenues except such as have been especially appropriated and pledged to the sinking fund ; second, the annual taxes which are included in the general levy made by the Board of Supervisors for State, County, and City purposes.

ANNUAL TAXES.

The following were the purposes and amounts for which taxes were levied for the year 1863 :



For the use of State—		
For common schools.....	\$401,132 71	
For canals, volunteer militia, & gener'l purposes	2,139,424 44	\$2,540,557 15
For county purposes, including support of police.....		2,954,019 29
For city purposes.....		6,062,095 74
Amount required for the payment of appropriations.....		\$11,556,672 18
Amount required to supply deficiencies .....		535,232 96
Total.....		\$12,091,905 14

To produce the amount required it was found necessary to fix the rate of taxation at \$2.03½ per \$100, or \$20.35 per \$1,000, as shown by the following statement:

Amount required to be raised, as above stated.....	\$12,091,905 14
Valuation of taxable property .....	\$594,196,813
Rate of tax \$20.35 per \$1,000. Product of tax by said rate...	12,091,905 14

The following table shows the valuation of the real and personal estate and the amount of tax in detail:

## REAL ESTATE, VALUATION, AND TAX.

Ward.	Valuations.	Amount of tax.
First.....	\$32,779,900	\$667,070 17
Second.....	19,621,028	399,266 70
Third.....	25,464,956	518,211 53
Fourth.....	9,187,100	186,955 39
Fifth.....	18,480,000	375,657 70
Sixth.....	12,949,150	263,513 43
Seventh.....	12,384,499	252,019 64
Eighth.....	18,156,000	369,470 31
Ninth.....	15,866,300	321,650 64
Tenth.....	8,755,000	178,161 60
Eleventh.....	9,054,700	184,257 17
Twelfth.....	14,134,825	287,611 45
Thirteenth.....	5,467,900	111,270 07
Fourteenth.....	12,422,000	252,785 40
Fifteenth.....	26,994,050	549,323 97
Sixteenth.....	18,508,900	376,647 50
Seventeenth.....	18,190,900	370,177 47
Eighteenth.....	37,104,000	755,059 18
Nineteenth.....	19,003,552	386,679 25
Twentieth.....	17,588,300	357,910 62
Twenty-first.....	31,972,250	650,627 45
Twenty-second.....	18,281,222	371,980 89
Total.....	\$402,286,532	\$8,186,307 59

## PERSONAL ESTATE, VALUATION, AND TAX.

Resident.....	\$179,310,329	
Non-resident.....	12,703,332	
	192,013,661	3,907,446 31
Total.....	\$594,800,193	12,093,773 90

The valuation for 1862 compared with 1863 was as follows:

	1862.	1863.
Real estate.....	\$400,238,964	\$402,187,382
Personal estate.....	172,416,031	191,967,161
Total.....	\$572,654,995	\$594,154,543

Showing a total increase in the valuation of real and personal estate of \$21,499,548.

The amount of the yearly taxes levied during the last five years has been as follows:

Years.	For the use of the corporation.	For county and State purposes.	Total.]
1859.....	\$6,546,034 11	\$3,314,891 98	\$9,860,926 09
1860.....	6,085,448 60	3,673,059 26	9,758,507 86
1861.....	6,713,293 40	4,914,338 88	11,627,632 28
1862.....	5,111,056 08	4,795,215 02	9,906,271 10
1863.....	6,341,202 96	5,750,702 18	12,091,905 14
	<hr/> \$30,797,035 15	<hr/> \$22,448,207 32	<hr/> \$53,245,242 47

The following was the amount of taxes collected in 1863:

Of the amount of the general levy for 1863.....	\$9,996,212 70
Amount of areas collected.....	963,807 86

Total collected from taxes during 1863..... \$10,960,020 56

These receipts were proportioned as follows between the city and county:

Amount transferred to the city treasurer .....	\$5,826,143 78
Amount to account of county treasurer.....	5,133,876 78

Total collections from taxes..... \$10,960,020 56

#### TOTAL RECEIPTS AND DISBURSEMENTS ON CITY ACCOUNT.

The following is a summary of the receipts and disbursements of the city for the year 1863:

##### *Receipts.*

From taxes, as stated above.....	\$5,826,143 78
From general fund, being license fees, interest on taxes, etc.....	1,234,862 12
From loans.....	7,886,657 13
From the sinking fund .....	3,500,170 63
Total receipts.....	\$18,447,833 64

##### *Disbursements.*

For the support of the city government.....	\$5,717,781 84
The payment of interest and annual instalments of the principal of that portion of the city debt provided for by appropriations made by the Common Council—	
Payment of interest .....	941,993 41
Payment of principal .....	571,657 36
	<hr/> \$1,513,650 77
Other loans paid .....	7,231,432 61
	<hr/> 3,309,900 00
Trust and special accounts.....	\$4,345,055 32
Sinking fund for redemption of city debt.....	2,380,427 49
Sinking fund for payment of interest on city debt.....	1,259,988 17
Total.....	<hr/> \$18,526,803 59

#### RECEIPTS AND DISBURSEMENTS OF COUNTY GOVERNMENT.

The following shows the different sources of revenue and amount received therefrom during the year 1863, and the disbursements during same time of the county government:

*Receipts.*

Amount of collections by the receiver of taxes placed to account of the county.....	\$5,133,876 78
General fund .....	66,920 18
Excise license fees .....	7,020 00
Temporary loans .....	2,417,700 00
New York county court house stock—Amount received for said stock, including premiums thereon .....	319,750 00
Substitute and relief fund bonds.....	946,700 00
Riot damages indemnity fund bonds—Amount received for said bonds, including premiums thereon .....	861,823 00
Soldiers' substitute bounty fund bonds.....	1,423,400 00

Total receipts..... \$11,175,689 96

For amount of receipts from the Board of Commissioners of excise for license fees paid out, as follows—

To the corporation of the City of New York toward the support of the poor, in pursuance of sec. 5 of the act, chap. 628 of the laws of 1857, .....	\$6,318 00
To the New York State Inebriate Asylum, being ten per cent of the receipts for excise license fees, in pursuance of chapter 381 of the laws of 1859 .....	702 00
	\$7,020 00

For payments for damages caused by riots in July, 1863 .....

713,589 33

Total payments..... \$11,092,738 49

We see from the above that the total receipts during the year of the city and county governments amount in the aggregate to \$30,000,000, or about one-half the total expenses of the United States Government before the war.

## DEBT OF THE CITY AND COUNTY OF NEW YORK.

Below will be found statements in detail of the debt of the county and City of New York :

## DEBT OF NEW YORK CITY.

Titles of Stocks and Bonds.	Amount Outstanding, Dec. 31, 1862.	Amount Outstanding, Dec. 31, 1863.	Interest, Per Cent.	When Interest Payable.
FUNDED DEBT.				
The Water Stock (1855).....	\$4,871	\$4,871	5	} Feb., May, Aug., Nov.
do do (1860).....	20,362	20,362	5	
do do (1870).....	3,000,200	3,000,200	5	
do do (1875).....	2,163,600	2,163,600	5	
do do (1879).....	.....	228,000	5	
do do (1880).....	2,147,000	1,147,000	5	} Feb. & Aug.
The Croton Water Stock (1883)...	1,800,000	1,800,000	6	
do do (1890)...	1,000,000	900,000	5	
do do (1890)...	100,000	100,000	6	} Feb. & Aug.
The Fire Indemnity Stock (1868)...	402,768	402,768	5	
Public Building Stock, No. 3 ('64-66)	200,000	150,000	5	} Feb., May, Aug., Nov.
The New York City 5 per cent Stock for Docks and Ships (1867-76)...	500,000	500,000	5	
Public Stock for Rebuilding Tomkins Market (1864-69).....	119,000	102,000	6	} Feb. & Aug.
Building Loan Stock, No. 3 (1870)...	75,000	75,000	5	
Public Education Stock (1873)...	154,000	154,000	5	
Building Loan Stock, No. 4 (1873)...	115,000	115,000	5	
Central Park Fund Stock (1887)...	3,066,071	3,066,071	6	

Central Park Fund Stock (1898)...	399,300	399,300	5	} Feb., May, Aug., Nov.
do do (1898)...	275,000	275,000	6	
Central Park Additional Fund Stock (1874) .....		1,000,000	6	
Central Park Improvement Fund Stock (1887) .....	2,083,200	2,083,200	6	
Central Park Improvement Fund Stock (1876) .....	1,666,000	1,966,000	6	
Floating Debt Fund Stock (1878) ..	2,748,000	2,748,000	6	
Real Estate Bonds (1873) .....	600,000	600,000	6	
<b>Total</b> .....	<u>\$22,539,372</u>	<u>\$24,000,372</u>		

## TEMPORARY AND OTHER LOANS.

Revenue Bonds, 1862 .....	\$183,600		5	
Street Improvement Fund Bonds, 1863 .....	317,000		6	
Street Improvement Fund Bonds, 1864 .....	800,000	\$800,000	7	
Street Improvement Fund Bonds, 1865 .....	600,000	600,000	6	
Assessment Bonds, 1862 .....	13,000	13,000	0	
Assessment Fund Bonds, 1864 ....	500,000	500,000	6	
do do 1865 ....	100,000	100,000	6	
Union Defense Fund Redemption Bonds, 1864 .....	895,570	895,570	6	
Volunteer Soldiers' Family Aid Fund Bonds, No. 2, 1863 .....	500,000		6	
Volunteer Soldiers' Family Aid Fund Bonds, No. 3, 1865 .....	500,000	500,000	6	
Volunteer Soldiers' Family Aid Fund Bonds, No. 4, 1865 .....	43,100	500,000	6	
Volunteer Soldiers' Family Aid Fund Bonds, No. 5, 1869 .....		500,000	5	
Volunteer Soldiers' Family Aid Fund Bonds, No. 6, 1870 .....		500,000	5	
Volunteer Soldiers' Family Aid Fund Bonds, No. 7, 1871 .....		500,000	5	
Volunteer Soldiers' Bounty Fund Bonds, 1863 .....	500,000		5	
Volunteer Soldiers' Bounty Fund Redemption Bonds, 1867 .....		450,000	6	
<b>Total</b> .....	<u>\$4,952,270</u>	<u>\$5,898,570</u>		

## RECAPITULATION.

Funded Debt, as above .....	\$22,539,372	\$24,000,372
Temporary Loans, as above .....	4,952,270	5,898,570
	<u>\$27,491,642</u>	<u>\$29,898,942</u>
Net increase, 1863, Funded Debt .....		\$1,461,000
do do Temporary and other Loans .....		946,800
		<u>\$2,407,800</u>

## DEBT OF THE COUNTY OF NEW YORK.

The following statement shows the amount of the County Debt at the close of each year since 1859 :



	1859.	1860.	1861.	1862.	1863.
Revenue bonds.....	.....	\$515,500	\$690,600	\$671,700	.....
Harlem River Free Bridge Bonds.....	\$20,000	60,000	60,000	60,000	\$40,000
New York County Court House Stock.....	.....	.....	.....	700,000	1,000,000
Substitute and Relief Fund Bonds.....	.....	.....	.....	.....	946,700
Soldiers' Substitute Bo- untty Fund Bonds....	.....	.....	.....	.....	1,423,400
Riot Damages Indem- nity Fund Bonds....	.....	.....	.....	.....	861,300
Totals.....	\$20,000	\$575,500	\$750,600	\$1,431,700	\$4,271,400

The total Debt, therefore, of the City and County of New York, was as follows, Dec. 31, 1863:

City Debt.....	\$29,898,942
County Debt.....	4,271,400
Total Debt, City and County.....	<u>\$34,170,342</u>

### TRADE OF NEW ORLEANS.

WE have in the New Orleans *Price Current*\* of September 1st the review of the trade of that city the past year, from which the following is prepared.

Some idea of the extent of the commercial loss this war is causing may be gathered from the following comparative table of the receipts from the interior at New Orleans of certain leading articles during 1863-64 and 1859-60:

#### RECEIPTS OF CERTAIN LEADING ARTICLES AT NEW ORLEANS.

	1863-64.	1859-60.	Decrease.
Apples.....bbls.	39,693	67,416	27,723
Bacon.....pkgs.	33,421	88,816	55,345
Bagging.....pcs.	2,208	21,427	19,219
Bale rope.....coils	14,495	125,429	110,934
Butter.....pkgs.	31,045	39,851	8,806
Bran.....sacks	44,093	274,277	230,184
Cotton.....bales	131,044	2,255,448	2,124,404
Corn.....sacks	410,138	1,722,039	1,311,901
Cheese.....boxes	35,744	95,305	59,561
Candles.....boxes	48,262	110,405	62,143
Coal.....bbls.	265,298	2,900,000	2,634,702
Flour.....	399,897	974,340	574,443
Glassware.....pkgs.	612	68,879	68,267
Hemp.....bales	213	4,883	4,665

\* On the first of September the publication of the regular edition of the New Orleans *Price Current* was resumed, the letter sheet only having been issued since December, 1863. It is with great pleasure that we again welcome this old friend. We see that the agent of the publishers in New York is Mr. JAMES V. RICH, 82 Nassau-street.—Ed. *Hunt's Merchants' Magazine*.

Hides.....	22,256	168,568	141,312
Lard..... bbls. and tcs.	18,027	85,784	47,759
Lard..... kegs	9,655	90,699	81,044
Lead..... pigs	30	80,964	80,934
Molasses..... bbls.	143,460	313,840	170,380
Onions.....	13,322	26,401	13,079
Oil, lard.....	1,162	9,333	8,171
Potatoes.....	150,615	207,698	57,083
Pork.....	67,022	216,523	144,501
Pork, bulk..... lbs.	.....	3,803,500	3,803,500
Ale..... bbls.	8,325	20,940	12,615
Packing yarn..... rls.	83	3,748	3,665
Sugar..... hhds.	75,153	195,185	120,032
Tobacco.....	1,363	80,955	79,592
Tobacco..... boxes	14,184	14,544	360
Whisky..... bbls.	16,615	185,042	169,657
Wheat..... sacks	529	13,116	12,587

The loss indicated by these figures does not of course fall on that city or State altogether—it is a loss that is felt over the whole country. Take the cotton crop for instance. What portion of the country was not benefited by or interested in the cultivation of that crop. The planters' cotton represented not only his profits but also the expenses attending the culture and sending to market, and the sale furnished the means to pay those expenses. If we look at the details of the expense account we will find they were incurred in the support of the planters family and of his servants and estates, and the proceeds of his sales were distributed all over the country. The pork and bacon and a large portion of the corn required to feed the negroes, most of the utensils used on the plantation, such as ploughs, hoes, &c., the bagging and rope, as well as many other articles too numerous to mention but essential to the production of the crop, were furnished by the farmers, packers, merchants, and manufacturers of the Western States; while the clothing, shoes, hats, blankets, medicines, &c., were received from the manufacturers and importers of the North; and the coffee, salt, and some other articles from New Orleans importers. Then again, a large part of the family expenses of the planter were for articles received from the West and the North, or imported from Europe. The expense of transportation from the West gave employment to Western boats, and thereby enriched Western boatmen and boat builders, and many of the expenses accruing at New Orleans were divided between the merchants and artisans of the city and their Northern and Western connections; such as the cost of wagons, carts, and other similar articles which were imported from the North.

Then, too, from the time the crop was placed on shipboard it proved a constant source of wealth throughout its progress and in all its various transformations. The ship owner, the merchant, the numerous class of persons engaged in handling it in its transit to the mills, and then the multitudes employed in spinning it or manufacturing it into fabrics or other forms for consumption, all derived more or less advantage from it as it passed through their hands. Resolving this industrial movement into its primary elements, we find that so far from the bale of cotton representing exclusively the Southern planter, his share in its production was much less than that of the farmers who furnished the food and the manufacturers who contributed the clothing of the laborers engaged in the cul-

ture. If a like enquiry were made with regard to other Southern crops, the answer would be similar. We thus get an idea of what is being actually lost by the war.

The following table shows the receipts, shipments, etc.; of cotton at New Orleans during the past twelve years :

RECEIPTS, SHIPMENTS, ETC., OF COTTON AT NEW ORLEANS.

	Receipts New Orleans.	Aver. price per bale.	Total value.	Total crop.	Date of receipt of first bale.	Rec'ts of new crop to Sept. 1.
1852-53..	1,664,864	\$41 00	\$68,259,424	3,262,882	Aug. 9	74
1853-54..	1,440,779	38 00	54,749,602	2,980,027	July 25	1,391
1854-55..	1,284,768	40 00	51,390,720	2,847,339	July 26	23,282
1855-56..	1,759,293	40 00	70,371,720	3,527,845	July 15	1,166
1856-57..	1,513,247	57 00	86,255,079	2,939,519	Aug. 15	33
1857-58..	1,678,616	52 50	88,127,340	3,113,962	July 25	4,834
1858-59..	1,774,298	58 00	92,037,794	3,851,481	July 28	9,698
1859-60..	2,255,448	48 50	109,389,228	4,675,770	July 5	36,670
1860-61..	1,849,312	50 00	92,465,600	3,699,926	Aug. 11	61
1861-62..	38,880	45 50	1,769,040	.....	.....	..
1862-63..	22,078	281 82	5,107,032	.....	Sept. 7	..
1863-64..	131,044	356 20	46,677,872	.....	Aug. 14	12
Total...	17,688,724		\$812,164,538			

The additional obstacles and expenses to be met by the planters before shipment, and the extra charges to be paid after it leaves his hands are a very great tax. Not, however, to particularize the planters additional difficulties and expenses before shipment, the subsequent charges are something as follows. On the arrival of the cotton at New Orleans the factor has to pay from \$5 to \$10 freight, where the charge was formerly seventy-five cents to \$1 50—also a hospital tax of \$5 per bale, and the internal revenue tax of two cents per pound or \$9 per bale; add to this three-fourths per cent for river insurance, and one per cent per month for fire insurance, one-fourth per cent for brokerage, and two-and-a-half per cent commission, and the entire present charges after the cotton leaves the planters hands to the time it is sold at New Orleans amount to about \$50 or \$60 per bale, or considerably more than the average value of a bale of cotton for many years before the war.

The following table shows the destination of the cotton and tobacco exported from New Orleans since 1859-60 :

EXPORTS OF COTTON FROM NEW ORLEANS.

Whither exported.	1863-64.	1863-63.	1861-62.	1860-61.	1859-60.
Liverpool.....	1,155	2,070	1,812	1,074,131	1,848,163
London .....	....	....	....	153	107
Glasgow, Greenock, etc. ....	....	....	....	32,767	16,437
Cowes, Falmouth, etc.....	....	....	....	10,034	19,147
Queenstown, Cork, etc.....	....	....	....	42,263	43,112
Havre .....	4,023	1,849	472	384,938	303,157
Bordeaux.....	....	....	....	3,704	2,395
Marseilles .....	....	....	....	283	3,735
Nantz, Cette, and Rouen.....	....	....	....	....	4,004
Amsterdam.....	....	....	....	3,411	2,949
Rotterdam and Ghent.....	....	....	....	1,700	5,205
Bremen .....	....	....	....	65,073	60,999
Antwerp, etc.....	....	....	....	12,343	16,362
Hamburg.....	....	....	....	5,551	9,079

Gottenburg and Stockholm.....	.....	.....	.....	10,426	13,522
Spain, Gibraltar, etc.....	.....	372	21,571	72,471	50,817
Mexico, etc.....	145	.....	.....	6,269	17,725
Genoa, Trieste, etc.....	162	.....	.....	34,618	61,228
St. Petersburg, etc.....	.....	.....	.....	23,538	28,019
New York.....	109,149	17,859	4,116	29,539	62,986
Boston.....	12,793	1,418	109	94,307	131,648
Providence, R. I.....	.....	40	.....	4,897	5,717
Philadelphia.....	703	143	98	855	5,257
Baltimore.....	.....	.....	.....	100	1,247
Other coastwise ports.....	.....	.....	.....	2,481	1,828
Total.....	128,130	23,750	27,678	1,915,852	2,214,296

## EXPORTS OF TOBACCO FROM NEW ORLEANS.

Whither exported.	1863-64.	1862-63.	1861-62.	1860-61.	1859-60
Liverpool.....	.....	569	.....	1,436	8,844
London.....	.....	.....	.....	3,017	6,308
Glasgow, Greenock, etc.....	.....	.....	.....	.....	.....
Cowes, Falmouth, etc.....	.....	.....	.....	3,011	2,013
Queenstown, Cork, etc.....	.....	.....	.....	.....	.....
Havre.....	7	2,359	100	3,179	2,010
Bordeaux.....	.....	780	.....	828	3,212
Marseilles.....	.....	830	.....	1,037	3,197
Nantz, Cette, and Rouen.....	.....	.....	.....	.....	.....
Amsterdam.....	.....	.....	.....	.....	1,143
Rotterdam and Ghent.....	.....	.....	.....	406	1,735
Bremen.....	123	1,361	536	5,084	13,694
Antwerp, etc.....	.....	733	.....	1,067	4,735
Hamburg.....	.....	.....	.....	20	64
Gottenburg and Stockholm.....	.....	.....	.....	.....	1,951
Spain, Gibraltar, etc.....	.....	2,040	1,243	9,560	10,848
Mexico, etc.....	3	.....	.....	.....	.....
Genoa, Trieste, etc.....	.....	343	.....	7,539	8,847
St. Petersburg, etc.....	.....	.....	.....	.....	.....
Other foreign ports.....	.....	.....	.....	1,816	4,640
New York.....	664	3,155	303	1,969	7,392
Boston.....	.....	226	.....	213	1,310
Providence, R. I.....	.....	.....	.....	.....	.....
Philadelphia.....	.....	43	.....	98	961
Baltimore.....	.....	117	37	.....	140
Portsmouth.....	.....	.....	.....	.....	.....
Other coastwise ports.....	.....	.....	.....	26	345
Western States.....	.....	.....	.....	.....	.....
Total.....	797	12,556	2,224	39,806	82,689

Below will be found the exports of sugar and molasses for three years :

## EXPORTS OF SUGAR AND MOLASSES FROM NEW ORLEANS—UP THE RIVER EXPORTED.

Whither exported.	1863-64.			1862-63.			1860-61.		
	Sugar.	Molasses.		Sugar.	Molasses.		Sugar.	Molasses.	
	hhds.	bbls.	bbls.	hhds.	bbls.	bbls.	hhds.	bbls.	bbls.
New York.....	34,185	1,278	63,312	31,645	8,037	145,066	21,436	607	40,088
Philadelphia.....	2,836	114	8,340	5,964	555	18,427	1,876	7	4,201
Charleston, S. C.....	.....	.....	.....	.....	.....	.....	2,491	2	7,765
Savannah.....	.....	.....	.....	.....	.....	.....	153	.....	329
Providence & Bristol...	.....	.....	17	7	7	393	4	1	5,623
Boston.....	2,336	138	6,735	9,856	941	22,120	151	4	10,344
Baltimore.....	130	.....	85	774	4	986	2,870	90	5,752
Norfolk, Richmond, & Petersburg, Va.....	.....	.....	.....	.....	.....	.....	2,900	.....	3,343
Mobile.....	.....	.....	.....	.....	.....	.....	7,225	1,251	30,726
Apalachicola, Pensacola	7	148	28	18	113	4	1,355	2,357	7,933
Other ports.....	.....	393	16	2	318	77	1,631	405	6,324
Total.....	39,484	2,071	63,533	98,966	9,969	187,143	42,163	4,724	122,512



## MILITARY FORCE OF THE STATES OF EUROPE.

THE following table, showing the military force of the different States of Europe, and the consequent fiscal burden in each, is taken from the *Annuaire Encyclopedique* for 1863:

Countries.	Army.	Population.	Expenses.	Cost per Man.	Inhabit- ants to One Soldier.	Propor- tion per cent to Total.
Germany.....	178,576	16,960,512	\$16,539,735	\$92 60	95	20
Austria.....	467,211	35,019,058	67,310,840	144 00	75	37
Belgium.....	40,115	4,671,183	6,450,525	160 29	117	23
Spain.....	120,000	15,500,000	25,132,370	209 20	129	25
Roman States....	8,845	684,806	886,965	100 00	77	—
France .....	513,349	37,500,000	137,729,075	268 18	73	33
Greece.....	10,291	1,096,000	1,084,500	59 60	100	32
Holland.....	59,481	3,569,456	9,381,580	158 18	60	25
Italy.....	314,285	21,920,269	65,934,225	209 79	70	27
Prussia.....	214,482	18,500,446	31,346,730	147 60	86	30
Great Britain ....	300,823	29,193,219	135,485,875	446 18	97	39
Russia .....	1,000,285	64,000,000	105,848,000	105 29	64	42
Denmark.....	50,000	2,605,024	3,507,720	71 37	105	37
Sweden .....	67,867	2,855,888	3,417,320	50 39	56	45
Norway.....	18,157	1,433,734	1,689,540	93 00	79	32
Turkey.....	429,000	39,000,000	20,000,000	76 00	91	—
Roumania .....	20,000	4,000,000	2,360,000	118 00	200	—
Servia.....	2,500	985,000	178,880	71 39	394	—
Switzerland.....	—	—	—	—	—	—
	3,815,217	299,494,195	\$644,283,880	\$168 87	76	32

*Note.*—The *francs* of the original table have been changed into dollars and cents at the rate of 5 francs to 1 dollar.

## LAW FOR MEASURING TONNAGE OF SHIPS, &amp;c.

AN ACT to regulate the Admeasurement of Tonnage of Ships and Vessels of the United States.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That every ship or vessel built within the United States, or that may be owned by a citizen or citizens thereof, on or after the first day of January, eighteen hundred and sixty-five, shall be measured and registered in the manner hereinafter provided; also, every ship or vessel that is now owned by a citizen or citizens of the United States shall be remeasured and reregistered upon her arrival after said day at a port of entry in the United States, and prior to her departure therefrom, in the same manner as hereinafter described: *Provided,* That any ship or vessel built within the United States after the passage of this act may be measured and registered in the manner herein provided.

SEC. 2. *And be it further enacted*, That the register of every vessel shall express her length and breadth, together with her depth and the height under the third or spar deck, which shall be ascertained in the following manner: The tonnage-deck, in vessels having three or more decks to the hull, shall be the second deck from below; in all other cases the upper deck of the hull is to be the tonnage-deck. The length from the forepart of the outer planking, on the side of the stem, to the afterpart of the main sternpost of screw steamers, and to the afterpart of the rudder-post of all other vessels measured on the top of the tonnage-deck, shall be accounted the vessel's length. The breadth of the broadest part on the outside of the vessel shall be accounted the vessel's breadth of beam. A measure from the under side of tonnage-deck plank, amidships, to the ceiling of the hold (average thickness) shall be accounted the depth of hold. If the vessel has a third deck, then the height from the top of the tonnage-deck plank to the under side of the upper-deck plank shall be accounted as the height under the spar deck. All measurement to be taken in feet and fractions of feet; and all fractions of feet shall be expressed in decimals.

SEC. 3. *And be it further enacted*, That the register tonnage of a vessel shall be her entire internal cubical capacity in tons of one hundred cubic feet each, to be ascertained as follows: Measure the length of the vessel in a straight line along the upper side of the tonnage-deck, from the inside of the inner plank (average thickness,) at the side of the stem to the inside of the plank on the stern timbers, (average thickness,) deducting from this length what is due to the rake of the bow in the thickness of the deck, and what is due to the rake of the stern-timber in the thickness of the deck, and also what is due to the rake of the stern-timber in one third of the round of the beam; divide the length so taken into the number of equal parts required by the following table, according to the class in such table to which the vessel belongs:—

## TABLE OF CLASSES.

Class 1.—Vessels of which the tonnage length according to the above measurement is fifty feet or under, into six equal parts.

Class 2.—Vessels of which the tonnage length according to the above measurement is above fifty feet, and not exceeding one hundred feet long, into eight equal parts.

Class 3.—Vessels of which the tonnage length according to the above measurement is above one hundred feet long, and not exceeding one hundred and fifty feet long, into ten equal parts.

Class 4.—Vessels of which the tonnage length according to the above measurement is above one hundred and fifty feet, and not exceeding two hundred feet long, into twelve equal parts.

Class 5.—Vessels of which the tonnage length according to the above measurement is above two hundred feet, and not exceeding two hundred and fifty feet long; into fourteen equal parts.

Class 6.—Vessels of which the tonnage length according to the above measurement is above two hundred and fifty feet long, into sixteen equal parts.

Then, the hold being sufficiently cleared to admit of the required depths and

breadths being properly taken, find the transverse area of such vessel at each point of division of the length as follows :—

Measure the depth at each point of division from a point at a distance of one third of the round of the beam below such deck, or, in case of a break, below a line stretched in continuation thereof, to the upper side of the floor-timber, at the inside of the limber-strake, after deducting the average thickness of the ceiling, which is between the bilge planks and limber-strake ; then, if the depth at the midship division of the length do not exceed sixteen feet, divide each depth into four equal parts ; then measure the inside horizontal breadth, at each of the three points of division, and also at the upper and lower points of the depth, extending each measurement to the average thickness of that part of the ceiling which is between the points of measurement ; number these breadths from above, (numbering the upper breadth one, and so on down to the lowest breadth ; ) multiply the second and fourth by four, and the third by two ; add these products together, and to the sum add the first breadth and the last, or fifth ; multiply the quantity thus obtained by one third of the common interval between the breadths, and the product shall be deemed the transverse area ; but if the midship depth exceed sixteen feet, divide each depth into six equal parts, instead of four, and measure, as before directed, the horizontal breadths at the five points of division, and also at the upper and lower points of the depth ; number them from above as before ; multiply the second, fourth, and sixth, by four, and the third and fifth by two ; add these products together, and to the sum add the first breadth and the last, or seventh ; multiply the quantities thus obtained by one third of the common interval between the breadths, and the product shall be deemed the transverse area.

Having thus ascertained the transverse area at each point of division of the length of the vessel, as required above, proceed to ascertain the register tonnage of the vessel in the following manner :—

Number the areas successively one, two, three, &c., number one being at the extreme limit of the length at the bow, and the last number at the extreme limit of the length at the stern ; then whether the length be divided according to table, into six or sixteen parts, as in classes one and six, or any intermediate number, as in classes two, three, four, and five, multiply the second, and every even-numbered area, by four, and the third and every odd-numbered area (except the first and last) by two ; add these products together, and to the sum add the first and last, if they yield anything ; multiply the quantities thus obtained by one third of the common interval between the areas, and the product will be the cubical contents of the space under the tonnage-deck ; divide this product by one hundred, and the quotient, being the tonnage under the tonnage-deck, shall be deemed to be the register tonnage of the vessel, subject to the additions hereinafter mentioned.

If there be a break, a poop, or any other permanent closed-in space on the upper decks, on the spar-deck, available for cargo, or stores, or for the berthing or accommodation of passengers or crew, the tonnage of such space shall be ascertained as follows :—

Measure the internal mean length of such space in feet, and divide it into an even number of equal parts of which the distance asunder shall be most nearly



equal to those into which the length of the tonnage-deck has been divided ; measure at the middle of its height the inside breadths, namely, one at each end and at each of the points of division, numbering them successively one, two, three, &c. ; then to the sum of the end breadths add four times the sum of the even-numbered breadths and twice the sum of the odd-numbered breadths, except the first and last, and multiply the whole sum by one third of the common interval between the breadths ; the product will give the mean horizontal area of such space ; then measure the mean height between the planks of the decks, and multiply by it the mean horizontal area ; divide the product by one hundred, and the quotient shall be deemed to be the tonnage of such space, and shall be added to the tonnage under the tonnage-decks, ascertained as aforesaid.

If a vessel has a third deck, or spar-deck, the tonnage of the space between it and the tonnage-deck shall be ascertained as follows :—

Measure in feet the inside length of the space, at the middle of its height, from the plank at the side of the stem, to the plank on the timbers at the stern, and divide the length into the same number of equal parts into which the length of the tonnage-deck is divided ; measure (also at the middle of its height) the inside breadth of the space at each of the points of division, also the breadth of the stem and the breadth at the stern ; number them successively one, two, three, and so forth, commencing at the stem ; multiply the second, and all other even-numbered breadths by four, and the third, and all the other odd-numbered breadths (except the first and last) by two ; to the sum of these products add the first and last breadths, multiply the whole sum by one third of the common interval between the breadths, and the result will give in superficial feet, the mean horizontal area of such space ; measure the mean height between the plank of the two decks, and multiply by it the mean horizontal area, and the product will be the cubical contents of the space ; divide this product by one hundred, and the quotient shall be deemed to be the tonnage of such space, and shall be added to the other tonnage of the vessel, ascertained as aforesaid. And if the vessel has more than three decks, the tonnage of each space between decks, above the tonnage-deck, shall be severally ascertained in the manner above described, and shall be added to the tonnage of the vessel, ascertained as aforesaid.

In ascertaining the tonnage of open vessels the upper edge of the upper strake is to form the boundary line of measurement, and the depth shall be taken from an athwartship line, extending from upper edge of said strake at each division of the length.

The register of the vessel shall express the number of decks, the tonnage under the tonnage deck, that of the between-decks, above the tonnage-deck ; also that of the poop or other enclosed spaces above the deck, each separately. In every registered United States ship or vessel the number denoting the total registered tonnage shall be deeply carved or otherwise permanently marked on her main beam, and shall be so continued ; and if it at any time cease to be so continued such vessel shall no longer be recognized as a registered United States vessel.

SEC. 4. *And be it further enacted*, That the charge for the measurement of tonnage and certifying the same shall not exceed the sum of one dollar and fifty cents for each transverse section under the tonnage-deck ; and the sum of three dollars for measuring each between-decks above the tonnage-deck ; and the sum



of one dollar and fifty cents for each poop, or closed-in space available for cargo or stores, or for the berthing or accommodation of passengers, or officers and crew above the upper or spar deck.

Sec. 5. *And be it further enacted*, That the provisions of this act shall not be deemed to apply to any vessel not required by law to be registered, or enrolled, or licensed, and all acts and parts of acts inconsistent with the provisions of this are hereby repealed.

Approved, May 6, 1864.

## LAW FOR PREVENTING COLLISIONS ON THE WATER.

CHAP. LXIX.—An act fixing certain Rules and Regulations for preventing Collisions on the Water.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That from and after September one, eighteen hundred and sixty-four, the following rules and regulations for preventing collisions on the water be adopted in the navy and the mercantile marine of the United States: *Provided*, That the exhibition of any light on board of a vessel-of-war of the United States may be suspended whenever, in the opinion of the Secretary of the Navy, the commander-in-chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

### PELIMINARY.

*Article 1.* In the following rules every steamship which is under sail, and not under steam, is to be considered a sailing-ship; and every steamship which is under steam, whether under sail or not, is to be considered a ship under steam.

### RULES CONCERNING LIGHTS.

#### LIGHTS.

*Article 2.* The lights mentioned in the following articles, and no others, shall be carried in all weathers between sunset and sunrise.

#### LIGHTS FOR STEAMSHIPS.

*Article 3.* All steam-vessels when under way shall carry—

(a) At the foremast head, a bright white light, so fixed as to show an uniform and unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the ship, viz : from right ahead to two points abaft the beam on either side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(b) On the starboard side, a green light, so constructed as to throw an uniform and unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(c) On the port side, a red light, so constructed as to show an uniform unbroken light over an arc of the horizon of ten points of the compass, so fixed as

to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(d) The said green and red side lights shall be fitted with inboard screens, projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

#### LIGHTS FOR STEAM-TUGS.

*Article 4.* Steamships, when towing other ships, shall carry two bright white masthead lights vertically, in addition to their side lights, so as to distinguish them from other steamships. Each of these masthead lights shall be of the same construction and character as the masthead lights which other steamships are required to carry.

#### LIGHTS FOR SAILING-SHIPS.

*Article 5.* Sailing-ships under way or being towed shall carry the same lights as steamships under way, with the exception of the white masthead lights, which they shall never carry.

#### EXCEPTIONAL LIGHTS FOR SMALL SAILING-VESSELS.

*Article 6.* Whenever, as in the case of small vessels during bad weather, the green and red lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel; ready for instant exhibition, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side, nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, they shall each be painted outside with the color of the light they respectively contain, and shall be provided with suitable screens.

#### LIGHTS FOR SHIPS AT ANCHOR.

*Article 7.* Ships, whether steamships or sailing-ships, when at anchor in roadsteads or fairways, shall, between sunset and sunrise, exhibit where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a globular lantern of eight inches in diameter, and so constructed as to show a clear uniform and unbroken light visible all around the horizon, and at a distance of at least one mile.

#### LIGHTS FOR PILOT-VESSELS.

*Article 8.* Sailing pilot-vessels shall not carry the lights required for other sailing-vessels, but shall carry a white light at the masthead, visible all round the horizon, and shall also exhibit a flare-up light every fifteen minutes.

#### LIGHTS FOR FISHING-VESSELS AND BOATS.

*Article 9.* Open fishing-boats and other open boats shall not be required to carry side lights required for other vessels, but shall, if they do not carry such lights, carry a lantern having a green slide on the one side and a red slide on the other side, and on the approach of or to other vessels, such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be

seen on the port side, nor the red light on the starboard side. Fishing-vessels and open boats when at anchor, or attached to their nets and stationary, shall exhibit a bright white light. Fishing-vessels and open boats shall, however, not be prevented from using a flare-up in addition, if considered expedient.

#### RULES GOVERNING FOG-SIGNALS.

##### FOG-SIGNALS.

*Article 10.* Whenever there is a fog, whether by day or night, the fog-signals described below shall be carried and used, and shall be sounded at least every five minutes, viz :

(a) Steamships under way shall use a steam-whistle placed before the funnel, not less than eight feet from the deck.

(b) Sailing-ships under way shall use a fog-horn.

(c) Steamships and sailing-ships when not under way shall use a bell.

#### STEERING AND SAILING RULES.

##### TWO SAILING-SHIPS MEETING.

*Article 11.* If two sailing-ships are meeting end on, or nearly end on, so as to invoke risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

##### TWO SAILING-SHIPS CROSSING.

*Article 12.* When two sailing-ships are crossing so as to involve risk of collision, then, if they have the wind on different sides, the ship with the wind on the port side shall keep out of the way of the ship with the wind on the starboard side, except in the case in which the ship with the wind on the port side is close-hauled, and the other ship free, in which case the latter ship shall keep out of the way. But if they have the wind on the same side, or if one of them has the wind aft, the ship which is to windward shall keep out of the way of the ship which is to leeward.

##### TWO SHIPS UNDER STEAM MEETING.

*Article 13.* If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

##### TWO SHIPS UNDER STEAM CROSSING.

*Article 14.* If two ships under steam are crossing so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

##### SAILING-SHIP AND SHIP UNDER STEAM.

*Article 15.* If two ships, one of which is a sailing-ship and the other a steamship, are proceeding in such directions as to involve risk of collision, the steamship shall keep out of the way of the sailing-ship.

##### SHIPS UNDER STEAM TO SLACKEN SPEED.

*Article 16.* Every steamship, when approaching another ship, so as to involve risk of collision, shall slacken her speed, or, if necessary, stop and reverse; and every steamship shall, when in a fog, go at a moderate speed.

## VESSELS OVERTAKING OTHER VESSELS.

*Article 17.* Every vessel overtaking any other vessel shall keep out of way of the said last-mentioned vessel.

## CONSTRUCTION OF ARTICLES 12, 14, 15, AND 17.

*Article 18.* Where, by the above rules, one of two ships is to keep out of the way, the other shall keep her course subject to the qualifications contained in the following article :

## PROVISO TO SAVE SPECIAL CASES.

*Article 19.* In obeying and construing these rules due regard must be had to all dangers of navigation, and due regard must also be had to any special circumstances which may exist in any particular case rendering a departure from the above rules necessary in order to avoid immediate danger.

## NO SHIP UNDER ANY CIRCUMSTANCES TO NEGLECT PROPER PRECAUTIONS.

*Article 20.* Nothing in these rules shall exonerate any ship, or the owner, or master, or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

Approved, April 29, 1864.

## INCOME AND EXPENDITURES OF GREAT BRITAIN AND IRELAND FOR THE YEAR ENDING JUNE 30, 1864.

THE following is an account of the gross public income of the United Kingdom of Great Britain and Ireland, in the year ending the 30th day of June, 1864, and of the actual payments within the same period, exclusive of the sums applied to the redemption of funded or paying off unfunded debt, and of the advances and repayments for local works, etc. :

INCOME.			
	£	s.	d.
Customs .....	22,821,000	0	0
Excise .....	18,666,000	0	0
Stamps .....	9,462,000	0	0
Taxes (land and assessed) .....	3,260,000	0	0
Property tax .....	8,635,000	0	0
Post-office .....	3,820,000	0	0
Crown lands, net .....	305,500	0	0
Miscellaneous—			
Produce of the sale of old stores and other military and naval extra receipts .....	£644,094	1	1
Amount received from the revenues of India on account of the effective and non-effective charges of British troops serving in that country, (including £369,889 18s. 7d. arrear charges .....	1,164,889	18	7



Allowance out of profits of issue received from the Bank of England, per act 24 Vict., c. 3.....	131,578	0	0		
Miscellaneous receipts, including interest and other moneys.....	648,151	4	4		
China war indemnity .....	434,747	0	0		
				3,023,460	4 0
Total revenue.....				69,992,960	4 0

## EXPENDITURE.

Interest and management of the permanent debt.....	23,714,810	11	7		
Terminable annuities.....	2,174,350	12	4		
Interest of exchequer bonds.....	92,500	0	0		
Interest of exchequer bills.....	315,558	5	10		
				26,297,219	9 9
Charges on consolidated fund :					
Civil list.....	406,015	14	6		
Annuities and pensions.....	322,435	3	9		
Salaries and allowances .....	176,250	5	1		
Diplomatic salaries and pensions..	170,327	2	1		
Courts of justice.....	680,001	13	11		
Miscellaneous charges.....	181,433	15	11		
				1,936,463	15 3
Supply services.					
Army .....	14,650,154	6	1		
Navy .....	10,909,602	7	9		
Miscellaneous civil services .....	7,360,333	19	1		
Salaries, etc., of revenue departments	4,548,383	10	1		
Packet service.....	679,396	18	2		
Kertch and Yenikale prize money..	85,925	0	0		
Scheldt toll redemption .....	174,598	16	1		
				38,409,394	17 3
Total ordinary expenditure .....				66,643,078	2 3
Expenses of fortifications provided for by money raised per act 25 and 26 Vict., c. 78.....				900,000	0 0
Total expenditure.....				67,543,078	2 3
Excess of income over ordinary expenditure, in the year ended 30th June, 1864.....	3,349,882	1	9		
Deduct,—Expenses of fortifications, as above .....	900,000	0	0		
				2,449,882	1 9
				69,992,960	4 0

## COMMERCIAL REGULATIONS.

### REVENUE LAW DECISIONS.

#### DECISIONS OF THE COMMISSIONERS UPON "RECEIPTS" AND BILLS OF LADING IN INTERNAL TRANSPORTATION.

THE Commissioner of Internal Revenue made a decision, a few days since, to the effect that *the person to whom a receipt is given must furnish the stamp.* Commissioner LEWIS says:—

"Ordinarily at law no person is bound to give a receipt for money paid. The receipt is an instrument of evidence, useful only to the person to whom it is given. If he needs a receipt, it is necessary for him to furnish the stamp, or to stamp the receipt, if required, before it is signed. The person who receives the money is not obliged to give a receipt unless the other party furnishes the proper stamp. If a person gives a receipt without requiring that the party to whom it is given shall furnish the stamp, the maker of the receipt must himself stamp the paper before he delivers it. If he fails to stamp it before he delivers it, he is liable to the penalty provided by law for the omission; but the other party may stamp it immediately upon its being received."

It would have been much simpler and better, as we think, if, by this new revenue law, every person were required, as is the case in England, to give on demand a stamped receipt to any one paying them money over a certain sum.

The Commissioner has also made the following decision respecting bills of lading. We give the correspondence in full:

NEW YORK, August 8, 1864.

HON. J. J. LEWIS, Commissioner of Internal Revenue, }  
Washington, D. C.

DEAR SIR,—Herewith I hand you a pro-forma bill of lading or receipt, which in character is about the same as is in use by all the railroad and transportation companies doing business between New York, Boston, Philadelphia, and Western States.

Will you please inform me if it requires a "stamp." If yea, what denomination?—Respectfully yours,

M. B. SPAULDING.

TREASURY DEPARTMENT, OFFICE OF INTERNAL REVENUE, }  
WASHINGTON, August 18th, 1864.

SIR,—In answer to your letter of the 8th inst., I have to say that receipts for the delivery of *any* property are chargeable with a stamp duty of two cents, and this applies to all dray receipts and all receipts issued or received by steamboats, railroads or express companies.

Bills of lading, or receipts for any goods, wares or merchandise, to be transferred from any port or place in the United States, and to be delivered at any port or place in the United States, are subject to the stamp of two cents.

Very respectfully, JOSEPH J. LEWIS, Commissioner.

The result of this decision is, that the railroads and all transporting companies will require the shipping merchants to send receipts "stamped."

## DECISIONS IN REGARD TO DRAY RECEIPTS.

OFFICIAL DECISION.

TREASURY DEPARTMENT, OFFICE OF INTERNAL REVENUE,  
WASHINGTON, September 13, 1864.

GENTLEMEN,—I reply to your letter of the 6th instant, that bills of lading or receipts of goods, wares, or merchandise, to be transported from one port or place in the United States, and to be delivered at any port or place in the United States, are subject to the stamp duty of two cents.

Duplicates or triplicates are subject to the same duty as originals.

The blank form submitted by you, called a "*dray ticket*," appears to be only a memorandum for sake of convenience, and not a receipt within the meaning of the act of Congress, is *not* subject to the stamp duty of two cents.

Very respectfully, JOSEPH J. LEWIS, Commissioner.

Messrs. HAMILTON & DUNNICA, St. Louis.

## REVENUE STAMPS ON FREIGHT RECEIPTS.

BOSTON BOARD OF TRADE.

A report has just been made by the Boston Board of Trade on this question of stamping receipts, in which they propose the following rules. Whether the Commissioner on Internal Revenue will review his numerous decisions is doubtful, but that he ought to is evident :

That receipts given at railroad stations, on the delivery of freight for transportation, be stamped by the railroad company.

That through receipts given by transportation companies or lines, be stamped at the expense of the shipper.

That receipts, given by consignees to railroad companies on the arrival of merchandise, be stamped by the consignees.

That receipts given at the ship's side, usually called mate's receipts, be stamped at the expense of the ship.

That bills of lading be stamped at the expense of the shipper.

That receipts for freight money be stamped at the expense of the party to whom the payment is made.

## THE BOOK TRADE.

*Mercantile Dictionary; a Complete Vocabulary of Commercial Technicalities, in English, Spanish and French.* By J. DE VEITELLE. D. APPLETON & Co.

THE *Mercantile Dictionary* of Mr. DE VEITELLE supplies one of the greatest wants of the commercial community. The office of foreign correspondent is one of the most responsible in a large firm, and requires such a complete knowledge of the mercantile technicalities and idiomatic expressions in the different languages, as but few, even of the most accomplished linguists, possess. He who realizes the importance of little things in business life, and sees the serious results of apparently the most trivial errors, can readily understand what might be the consequence of an idiom wrongly translated,

by giving to the receiver of the letter an entirely false idea. To prevent these errors is the object of the *Mercantile Dictionary*. The correspondent, when brought to a stand still, can refer to it, and is immediately set right; whereas, without it, he might waste much time searching through the most comprehensive general dictionaries, which, being prepared for an entirely different purpose, might fail at last to give him the desired information. The book itself is very well gotten up, and is too small to be at all in the way, when standing, in a convenient place, on the desk. We regret that the German does not also form one of the languages, as that is now so important to the mercantile world.

*Heath's Infallible Counterfeit Detector at Sight.* The only infallible method of detecting counterfeit, spurious, and altered bank-notes, and applicable to all banks in the United States and Canadas, as now in circulation or that may be issued, with genuine bank-note designs, by the American Bank-Note Co. Boston: LABAN HEATH. 1864.

ANY reliable method of detecting spurious notes in these days of paper currency, when counterfeiting might almost be said to form a regular business, is a matter of importance to every individual; how much more so is it, when the method is so simple, as to be understood by every one, who will take the trouble to examine it and so infallible as to detect the most carefully prepared counterfeit, even on the first application of the test. Mr. HEATH's method for detecting bad bills requires no knowledge of the different banks, which are scattered, as thick as blackberries, all over the country; but the fineness of the work is made to tell whether the bill is good or bad. Genuine bank notes are prepared by one or the other of the great Bank-Note Companies, whose machinery is exceedingly costly, and whose engraving is of the very finest description. No engraving done by hand can equal that done by this machinery, and no counterfeiter would care to invest \$75,000 to \$150,000 in an illegitimate business, which, if discovered—and on account of the bulk of the machinery it would be difficult to conceal it—would not only result in a total loss of capital, but subject him also to a criminal's punishment. There are also ways given to detect altered bills, and the book is illustrated by very beautiful specimens of bank note engraving. It will be found very useful to those—and their name is legion—who would rather carry good than bad money, in their pockets.

*The Potomac and the Rapidan.* Army Notes, from the Failure at Winchester to the Reinforcement of Rosecrans. By ALONZO H. QUINT, Chaplain of the Second Massachusetts Infantry. CROSBY & NICHOLS, Boston, Mass.; O. S. FELT, N. Y.

A SERIES of letters written to the *Congregationalist*, by one of its clerical army correspondents, after being carefully revised, forms the basis of this work. The author, being the chaplain of one of the Bay State regiments, whose perils and privations he has shared, and whose glories he has a right to be proud of, is, by his position, highly qualified to tell us of those incidents which he himself has seen. His narrative extends over some of the most interesting portions of the war. It embraces the period, when, at the termination of the peninsular campaign, Gen. PORE in vain strove to stem the onward current of invasion, and after carrying us through the battle of Antietam, the incidents of the following winter, and the disastrous defeat at Chancellorville, it shifts the scene to Tennessee, and gives an account of army doings there. Thus this little book presents a double attraction. By reading it we kill two birds with one stone. We obtain a knowledge of army life, both in Virginia and Tennessee; we are intro-



duced to the armies of the Potomac and of the Cumberland. Such notes as these—giving the observations of intelligent eye-witnesses—cannot fail to be interesting to the general reader now, and invaluable to the historian hereafter.

*The Forest Arcadia of Northern New York*, embracing a view of its Mineral, Agricultural and Timber resources. Boston: Published by T. O. H. P. BURNHAM, 1864.

THIS little book, issued from the press of T. O. H. P. BURNHAM, of Boston, does the greatest credit to both author and publisher.

As may be gathered from the title, it is a narrative of sights and incidents, seen and experienced, on visiting that portion of the great wilderness of Northern New York lying in St. Lawrence County, on the Western slope of the Adirondac Mountains. The plateau, of which this section is a part, is said to embrace many thousand square miles in extent, to be very fertile, and to have an elevation of from fifteen hundred to eighteen hundred feet above the sea. A country thus favored, watered by the Grass and Oswegatchie Rivers, following by circuitous windings the stratification of the country, studded with numerous lakes and ponds, adding a beauty of their own to the silent wildness of the place, could not fail to draw out the enthusiasm of the ardent lover of nature. Such an one the author seems to be, and it is not wonderful, therefore, that he should be inspired by his subject, and that his impressions and thoughts should well out with freshness, vigor and beauty. Thus, in his pleasant way, he gives us an account of the movements of himself and party from place to place, the little incidents occurring, together with much valuable information respecting the resources and attractions of the district visited, thoroughly inoculating the reader with his enthusiasm. The book will well repay one for reading it.

The publisher, also, deserves great credit for the beautiful style in which the book is issued: the paper is excellent (tinted), the type clear, and the binding extremely neat.

*The Destiny of Our Country.* By CHARLES P. KIRKLAND, of New York. Published by ANSON D. F. RANDOLPH, 770 Broadway.

THIS address is not precisely what its title would indicate, but rather an examination into the causes, probable issue, and effects of the present rebellion, and was delivered before the Alumni of Hamilton College at their last commencement.

MR. KIRKLAND is a very able writer, full of enthusiasm, and particularly so on all subjects connected with the war. Whatever he writes, therefore, is of decided interest, whether one agrees with his conclusions or not. Just how or why this war was begun and what will be its end, are questions upon which there must be different opinions; and yet all will be glad to see the views presented in this address, knowing that they are the earnest convictions of one who has the true interests of his country at heart.

1. *The First Three Books of Xenophon's Anabasis*, with Explanatory Notes, Vocabulary, Maps, etc. By JAMES R. BOISE, Professor in the University of Michigan. D. APPLETON & Co., 443 and 445 Broadway.
2. *Progressive Lessons in Greek*, with Notes, Vocabulary, and Epitome of Greek Grammar for the Use of Beginners. By WILLIAM B. SILBU, A. M., New York Free Academy. D. APPLETON & Co.

THE above edition of Xenophon's *Anabasis* has many excellent features to recommend

it to the student and teacher. The map which is given showing the rout of the ten thousand Greeks, the very full notes and excellent vocabulary at the end of the volume are certainly extremely important aids, making the edition a truly valuable one. To the younger student and the beginner of whatever age, the "Progressive Lessons in Greek" will prove very acceptable. Great care appears to have been used in the arrangement, so that with this little book, one might by his own unaided efforts make great progress in the study of the Greek.

1. *An Elementary Arithmetic.* By G. P. QUACKENBOS, A. M. D. APPLETON & Co. New York.

2. *First Book in English Grammar.* By G. P. QUACKENBOS, A. M. D. APPLETON & Co.

THESE books are intended for children, and have been very favorably received. The Arithmetic is an agreeable combination of Slate exercises and mental operations:

## THE MERCHANTS' MAGAZINE AND COMMERCIAL REVIEW.

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